TRANSACTIONS

OF THE

Massachusetts Horticultural Society,

FOR THE YEAR 1877.

PART I.

BOSTON:
PRINTED FOR THE SOCIETY.
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The Committee on Publication and Discussion take this opportunity to repeat what they have heretofore stated, that the Society is not to be held responsible for the certainty of the statements or the correctness of the opinions expressed in the papers and discussions now or before published, but undertakes only to present these papers and discussions, or the substance of them, correctly. The award of a prize for an Essay is not to be understood as implying that the Committee approve it in every particular, but only that they believe it calculated, *on the whole*, to promote the science or art of Horticulture.

William C. Strong, *Chairman.*

TRANSACTIONS

OF THE

Massachusetts Horticultural Society.

BUSINESS MEETING.

SATURDAY, January 6, 1877.

A duly notified stated meeting was holden at 11 o'clock, President PARKMAN in the chair.

The President read the following address.

ADDRESS OF PRESIDENT PARKMAN.

During the last year the working of the body of laws, adopted in the year that preceded, has been put to the test. The result has been all that could be wished. The new order of things seems to have given universal satisfaction. The advantages of the most important change, that affecting the powers and functions of the Executive Committee, are beginning, at length, to be recognized. This Committee, composed, in part, of persons in whom the Society has placed its highest confidence, and on whom it has conferred its highest offices; and in part of persons chosen by it for this special purpose, and subject to removal by its annual vote, supplies a want which has long been felt. The duty of the Committee is not only to watch over the interests of the Society, and make such suggestions as its welfare may seem to require, but also to receive the complaints of members, consider all causes of dissatisfaction which may be brought before it, and take such action as may best promote general harmony and good feeling. It provides members with a source of relief from grievances which hitherto have had no means of redress.

Another important change embodied in the new By-Laws is that which opens the prizes of the Society to general competition. The result of this provision has been precisely what was expected by its originators. No perceptible change has taken place in the distribution of prizes. Now, as heretofore, they are won by our own members; and they will continue to be so; for with us the admission to membership is so easy, and its burdens so light, that those who have the inclination to compete for our prizes will soon seek to enroll themselves among us. At the same time, the stigma of illiberality, which a Society endowed like ours can ill afford to bear, has been completely removed.

During the ten years past we have made a growth as rapid as it is healthy, and we still continue to make it. The discussions on horticultural subjects, which are one of its most marked indications, have never been better attended, or more interesting than during the last winter and spring, and their value has been widely recognized in this and in other countries. A conspicuous improvement has taken place in our winter exhibitions, which a few years ago could hardly be said to exist. Displays were made last winter so admirable that they might almost dispute the palm with those of summer; and they had the advantage of being accessible to a class of persons who are apt to be absent from town during the usual exhibition season. The summer displays, in spite of the heat and drought, were fully equal to those of former years; and at some points they were superior. The show of specimen roses, in particular, was never before so fine; and the show of fruit was, in some departments, unusually good.

In the autumn of 1875, an experiment was tried with results so unsatisfactory that it was not thought expedient to repeat it. All our members, with their families, were invited to join in a dinner, the cost of which was borne mainly by the Society, the guests contributing but a fraction. To make it wholly free to so many persons would have involved an unsupportable expense; so few, however, applied for the tickets that a failure would have taken place had not a considerable number been purchased and distributed gratuitously by a few individual members. In view of this imperfect success, the annual entertainment of last autumn was restricted to the usual simple dinner to those who had given time and labor to the official work of the year.

Our general prosperity is not without one shadow. The report

of the Treasurer will show a deficit, arising partly from the general depression of business, causing a serious reduction in the rents of our halls, and partly from the entire failure of the dividend from Mount Auburn, which was once the main source of our income. Such failure has never happened before, and let us hope that it will not happen again. The reduction of our income is not relatively greater than that of many other institutions, and it is far less than that of some. Meanwhile, we can comfort ourselves with the assurance that we are in a condition to bear it better than any other horticultural society in America, if we but recognize the inevitable fact, and adapt ourselves to it by careful husbanding of the resources which remain.

The following appropriations, recommended by the Executive Committee, were voted:

For Prizes for Plants and Flowers,	$3,000
" " " Fruits,	1,900
" " " Vegetables,	1,000
" " " Gardens,	200
	$6,100
For Testimonial to Edward S. Rand, Jr., Ex-Recording Secretary, agreeably to the report of the Special Committee on that subject,	100
For the Library Committee, for the purchase of magazines and newspapers, binding of books, and incidental expenses of the Committee,	300
For the Committee on Publication and Discussion,	250

E. W. Buswell read his Annual Report as Treasurer, including the Report of the Finance Committee, which was accepted and referred to the Committee on Publication.

William C. Strong, Chairman of the Committee on Publication and Discussion, read the Annual Report of that Committee, which was accepted and referred back to the Committee. Messrs. Strong and Muzzey, of the Committee, also announced the arrangements for the Meetings for Discussion, during the winter, including lectures by Prof. George L. Goodale, of Harvard University, who kindly volunteered his services, and several other scientific gentlemen.

Robert Manning read his Annual Report as Secretary, which was accepted and referred to the Committee on Publication.

On motion of E. S. Rand, Jr., it was voted to postpone the consideration of the offers of Prospective Prizes for one week.

W. C. Strong, Chairman of the Committee on Publication and Discussion, announced that a meeting would be held on the next Saturday, at 12 o'clock, when it was expected that a Prize Essay on the Culture of the Melon and Squash would be read.

Adjourned to Saturday, January 13.

BUSINESS MEETING.

Saturday, January 13, 1877.

An adjourned meeting of the Society was holden at 11 o'clock. The President and Vice-Presidents being absent, William C. Strong was chosen President *pro tem.*

Mr. Strong, as Chairman of the Committee appointed April 1, 1876, to take into consideration the recommendations concerning the Society's Herbarium, in the paper read by the Professor of Botany, reported that while the Committee appreciated the remarks of the gentlemen who spoke in favor of these recommendations, they were of the opinion that in the present financial condition of the Society it was inexpedient to take any action, and asked to be discharged. The report was accepted, and the Committee was discharged.

It was then voted to take up the matter of Prospective Prizes, and after a full discussion by C. M. Hovey, J. B. Moore, E. S. Rand, Jr., W. C. Strong, N. B. White, William Gray, Jr., M. H. Merriam, R. Manning, and F. W. Kelsey, the following votes were passed:

Voted, That it is the sense of the Society that in the offer of Prospective Prizes, the words "a public trial of three [or five] years" should be changed to "a trial satisfactory to the several committees."

Voted, That as the Schedule of Prizes for 1877 is already published, this construction shall be applied to the present year.

Voted, That the respective committees be instructed to recommend all awards of Prospective Prizes to the Society, for approval, on the first Saturday in December, of each year, and that all such

awards shall be made by the several committees subject to such approval.

Adjourned to the first Saturday in February.

MEETING FOR DISCUSSION.

The Chairman introduced J. W. Pierce, of West Millbury, Mass., who read the following Essay, for which a prize had been awarded by the Committee on Discussion:

Squash and Melon Culture.

—

BY J. W. PIERCE.

—

Squashes.

The squash is one of the most important of our garden vegetables. It has been greatly improved within a few years, and is rapidly gaining in public favor. In old times the common pumpkin was used where squashes are now. Then not only pies were made of pumpkins, but they were boiled and served for the table; but how they must have tasted compared with the Hubbard or Butman squash of to-day! I do not know of any plant which will produce so much good, wholesome food for man or beast from an acre of land as the squash, unless we except the cabbage, and by the American people the former is deemed vastly superior for the table.

The origin and early history of the squash seem to be shrouded in mystery, mainly owing to the readiness with which the different varieties intermix with each other and with the pumpkin. Indeed the distinction between a squash and a pumpkin is very indefinite; we all know a squash from a pumpkin, yet it is difficult to define the difference, and really there is more difference in flavor and looks between different varieties of squashes than between some kinds of squashes and some kinds of pumpkins. The squash belongs to the same family with the pumpkin, watermelon, cucumber, and musk-melon. These are all annual plants of the natural order, *Cucurbitaceæ*, or Gourd family, which is of a tropical or subtropical origin.

Different varieties of squashes and pumpkins seem to come from different countries, yet, with a few exceptions of recent introduction, we know very little about their origin. Prof. Asa Gray, says: "The pumpkin was cultivated by the North American Indians, before the coming of the whites." He also says: "The orange and egg gourd grows wild in Texas, and is probably the original of all this group."

It seems to me that the pumpkin might have originated from the gourd, and the squash from the pumpkin. The fact that the gourd is more vigorous and productive than the pumpkin, and that the pumpkin is more vigorous than the squash, seems to indicate this order of improvement. It is a well established fact that the farther from the original an animal or plant is carried by domestication and improvement, the less vigor it has, and certainly our best squashes have less constitution and vigor than the pumpkin, and the pumpkin less than the wild gourd.

Selecting the Soil. The first step in order to raise a paying crop of squashes, is to select a soil suited to the crop, for without the right soil it is useless to waste time, seed, and manure. The squash requires a rich, warm soil, — such a soil as will produce seventy-five bushels of corn per acre. It should be a strong loam, without too much sand, or too heavy with clay, yet it would be better to be quite light than heavy and cold. As a general rule squashes grown on light, warm land are not so large, but are more solid, keep better, and are of better flavor than those grown on low or cold land. A side-hill with a southern aspect is preferable, especially when one's land is late and cold. It is useless to attempt to grow squashes on cold or wet land, for, like corn, they are very sensitive to cold, and will not grow in the shade, or where the land is saturated with water. Squashes may be grown either on inverted sods, or on old tillage land, but I prefer the sod land, because it is freer from weeds and bugs than old land.

Preparing the Soil. Having selected a suitable soil, how shall we prepare it for planting? If old tillage land, I would plough it in the fall, and again in the spring plough and harrow just before planting; but if green sward is to be planted, plough and harrow late in May, as near planting time as possible, so as to avoid the weeds, which will start before the squashes, if the land lies unworked long before planting. Then again by ploughing grass just before planting, we turn under a light crop of green grass which

will help to rot the sod and make the soil light and porous; this I consider very desirable, because the squash vine must have warmth and air in order to thrive.

Manure and its Application. The squash is a gross feeder, and delights in an abundance of nitrogenous manure. All kinds of manure seem to agree with it excepting kelp, salt fish, and other manures containing salt. The squash is very rich in nitrogenous substances and consequently requires nitrogenous manures, while it does not need so much phosphoric acid as the cereals. I have found hen manure the best fertilizer I could apply to squashes. It is very heating and is rich in nitrogen. I find by experiment that home-made superphosphate will grow better corn than hen manure, while the hen manure, will grow double the amount of squashes that the superphosphate will. As a general rule, the more manure we apply to squashes, the larger crop we obtain. I have never found a limit to the profitable application of manure to squashes; of course there is such a limit, but it is very seldom reached. The more manure we apply the surer we are of a crop in spite of a possible drought, for well-manured squashes will flourish, while others, growing on a short allowance of this indispensable article, will wilt and dry up; indeed, we need not fear the drought, with good land, plenty of manure, and thorough cultivation. The past season I applied eight cords of green manure from under the cow stable, spread on, and a shovelful of dry hen manure in each hill; and I would recommend more rather than less. Great care must be taken in covering the manure in the hill, as hen manure, or other strong nitrogenous manures will destroy the seed if they come in contact with it. It will not be safe to rely on kicking the dirt over the manure with the foot, but a very much better way is to have a man go ahead with a hoe, to press the manure down and cover it with an inch of fine earth. Guano, night-soil, or well rotted stable manure may be used with good success. If stable manure is used, I would apply not less than three or four shovelfuls in each hill. We must have manure enough to warm the soil and give the plants a good start, so as to drive them ahead of the bugs. The roots of a squash vine run very close to the surface, and consequently we should apply the manure at the surface and work it in very lightly. It is also best to apply part broadcast and a part in the hill, for that in the hill will give the plants an early start, driving them ahead of the bugs, while that applied broadcast will help to sustain

the vines after the roots have got beyond the hill, and will also be found by the little roots which grow from each joint after the vine begins to run.

When shall we Plant? This depends on the season; but a safe rule will be to plant as soon as cherry trees begin to blossom. The squash needs the whole season of warm weather to perfect itself, and should be planted as soon as the ground is warm and dry. It is better to plant too early than too late, for when planted too early, we only lose the seed, and can plant over again. In ordinary seasons the fifteenth of May is none too early.

Planting the Seed. Having ploughed the land, and worked a good dressing of manure into the surface soil, the rows should be marked out seven or eight feet apart each way, and a slight hole, large enough to hold the manure below the surface, should be made. I find seven feet about the right distance apart, and better than a greater distance, as missing hills will be covered by the vines from other hills, making a more even field. Press the manure down level and cover it with an inch of fine earth, and drop six or seven seeds in each hill, taking care to spread them evenly over the hill, and cover, if the soil is moist, only one inch deep, but if dry, one and a half inches is better. I do not like to press the soil over the seed unless it is very dry or sandy, for pressing moist soil makes it cake, and obstructs the tender plant in coming up.

Thinning out the Plants in the Hills. As soon as the plants get a good vigorous start, with five or six leaves on them, they should be thinned to three or four in a hill, depending somewhat on the number in the surrounding hills. Where there are missing hills those around may be left thicker so as to cover the vacancy. I know I am recommending very much thicker planting than most writers on squash culture, but I am convinced it is best to leave a good stand of plants, making some allowance for loss by insect enemies. I also fail to see the disadvantage of too thick planting, as some do. I like to have the ground covered so as not to give the weeds a chance, and so that the leaves may be some protection to the fruit against an early frost, which may take us by surprise. When I began to raise squashes I thinned a good deal closer than I do now, and the bugs thinned closer still, which made the crop quite light sometimes. It is better to have too many vines than not enough.

Hoeing and after Cultivation. As soon as the plants appear

above ground, they should be cultivated out, and the soil loosened around them with a hoe. After this, keep the cultivator and hoe going often, so as to keep the soil light and the weeds down. It is very important to hoe and cultivate often at first, so as to get the land clean before the vines begin to run. Then they should be cultivated and hoed for the last time, drawing the soil around the roots in a broad, flat hill, but not very high. I like to have the vines covered for a little distance, as I think it makes them stronger, and is something of a protection from the borers. It will be found better for the crop, to keep out of the field after the vines cross the rows, even if the weeds do grow, for moving the vines will be of more injury than the weeds. It is better to get the land so clean before the vines run that the squashes will keep ahead of the weeds.

How to Protect Squashes from their Enemies. The greatest difficulty in raising squashes is to protect them from the insect enemies, which continually attack them, from the time the leaves appear above ground until the fruit is ripe. But they can be protected by constant care and attention, and no one who is not willing to give them this, should attempt to raise squashes. By this I do not mean that they need to have a great amount of labor performed on them daily, but that they should be watched closely, to see if they are doing well. As soon as the leaves are seen above ground, they should be watched for the appearance of the striped bug; and as soon as he is found, the plants should be dusted over with plaster in the morning when the dew is on, or immediately after a rain, while they are yet wet, so that the plaster will stick to the leaves. This should be repeated every few days and after every rain, which will wash it off, until the bugs leave, or the vines are too large for them to injure. The most expeditious way to do this is to go through the field with a pail of plaster and a hand sieve or dredging box, such as we kill potato beetles with, and shake the plaster over the vines. It will take but little if applied in this way. Ashes, air-slacked lime, or fine earth, will answer, but are not so good as plaster. I have also tried sulphur, but cannot recommend it, as it seems to poison the vines. About the time the third or fourth leaf is out, the black bug will appear, usually in pairs—two, four, six, or more on a hill. They are found around the stalk at the surface of the ground, and often cut it off in a few days. These are the old bugs which have survived the winter, in a dormant state, hidden

away under old rubbish, in stone heaps and similar places. This is the most critical time in the growth of the squash, and if it is neglected now so as to allow these bugs to lay their eggs for a new crop of bugs, we may as well give up the squash patch at once, for it will be impossible to raise a good crop of squashes if the vines are covered with black bugs. The only successful warfare we can wage against them is to kill these old bugs before they lay their eggs. This can be expeditiously done by placing a shingle on the ground close to the vines of each hill, although every other hill will be enough usually, as they will leave the hills which have no shingle for those that have. Having placed the shingles, go round every morning with a pail, and brush the bugs, which are on the under side of the shingle, into the pail, and scald or burn them. If faithfully applied, this will be a sure cure for the black bug scourge, but it must be followed up closely, until the vines run, or enough will escape to perpetuate the race and destroy the crop of squashes.

Wilting Squash Vines. The question is often asked, "What makes my squash vines wilt and die when nearly grown?" This may be the result of a variety of causes; often a borer which is eating out the inside of the stem. Of these borers there are said to be two or more kinds. They are hatched from eggs laid by an insect on the vine near the root. When the borer is at work his presence may be detected by his excrements, which will be seen at his place of entrance near the root, or at a joint. The vine may be split open and the borers removed, and if well covered with moist earth may sometimes be restored. Mr. Warner, of Sunderland, reported at one of the meetings of the State Board of Agriculture that he was successful in destroying the borer by the application of tobacco to the roots of the vine. In my experience with squashes I have never been able to find a borer, but have, in a few instances, found maggots eating up the roots of wilting vines. Not being able to find the borer, I have been led to look for other causes, and have come to the conclusion that the black bug is oftener the cause of the mischief than most people are aware of. By following these wilting vines to their source, a few black bugs will often be found on the under side of the leaves, near the roots. Sometimes no bugs will be found, but a few dry leaves will tell that they have been doing the mischief but have left. I believe these black bugs are the cause of four-fifths of all the wilting of squash vines. The black bug seems to be very poisonous to the squash. They often attack

a nearly mature squash and it soon wilts and rots, and the presence of a few on the leaves of a vine near the root seems to poison the entire vine and often causes its death. Several years ago I lost an acre of squashes in this way, after the fruit was set, and some of it nearly grown. It all rotted and was an entire failure. When the vines are wilting from this cause, I think the best remedy is, to go into the field, hunt them up, and destroy them. This may be done by making a pair of paddles of shingles and squeezing the bugs between them, care being taken not to injure the vines.

Woodchucks are often very destructive to squashes. Killing them with dog, gun, and traps seems to be the only remedy. Smoking them out with brimstone and putting poisoned apples into their holes have been recommended, but I have never tried these methods.

Harvesting and Marketing the Crop. The ripening of a squash, if of a soft stemmed variety, is indicated by the shrivelling and drying up of the stem where it joins the squash. As a squash ripens, its upper surface assumes a deeper color; the green colored ones turn brownish on top, and the yellow kinds turn to a dark yellow or orange color; the hard shell kinds harden. As fast as they ripen it is best to gather and market, if there is a fair demand for them with remunerative prices, as they seldom pay for the care, extra labor, and loss by decay, when stored. The earlier they are sold, the better price they will usually bring, unless kept until midwinter. The weather should be closely watched so as to anticipate the first frost in season to gather the remainder of the crops into heaps, or into a shed where they may be protected from frost. When first gathered avoid piling them on top of each other as much as possible, as they are apt to rot where they touch, when piled before they are ripe, but let them lie spread out where they will dry and ripen, out of danger of frost.

Keeping Winter Squashes. Keeping squashes in winter seems to be attended with considerable difficulty. They cannot be kept where it is damp, as in most cellars, or where frost can reach them, nor will they keep so well where it is very warm. The best conditions for keeping them seem to be where the air is cool and dry, yet safe from frost. An attic chamber until winter; then a closet near the chimney where the frost cannot reach, or the temperature does not rise very high, is the best most families can command. Extensive market gardeners often keep them in houses built for the

purpose, where they can maintain an even temperature by the aid of fires and ventilation.

Saving the Seed. Great care should be taken to save seed only from perfect specimens, which are up to the standard requirements of their kind, and as much superior as possible. When two or more kinds are planted near together the seed should not be saved, as the product will be only mongrels, owing to the readiness with which they mix. But it is better to plant each variety by itself; and to save our own seed, for the squash can be wonderfully improved by good cultivation and careful selection of seed. I do not believe in changing seed, for the sake of a change. I have some varieties of squashes, the seed of which I would not exchange with any one, and I take great care to keep them pure. The seed of a squash should not be saved unless the quality and flavor prove satisfactory at the table. When thoroughly dry, the seed should be carefully marked with the name of the variety and the year. The special characteristics of the specimen, if it has any, should also be marked, as extra dry, extra sweet, or very large.

The Future Improvement of the Squash. Although the squash has been wonderfully improved of late years, I do not think it has reached perfection. Indeed, I believe it may be improved more in the future than it has been in the past. The wonderful success of Mr. Butman in hybridizing, by which he produced the variety which bears his name, is an encouraging sign of future improvement. Yet good as his new squash is, I do not consider it perfect. I believe a squash may be produced as sweet and dry as a sweet potato, with as hard a shell as the Hubbard or the Butman, with as delicate a color as the Butman when served for the table, and as thick meated and productive as the American Turban. Certainly we have no such squash now. Who will be the one to produce it, and thereby immortalize his name?

Feeding Squashes to Stock. The squash is very rich in flesh and fat-forming elements, consequently it is a valuable food for stock, and all the waste of the crop should be carefully saved and fed. The specked and green ones, boiled up and mixed with meal and shorts, make excellent food for swine and poultry, and cut up raw they are valuable for cows and young stock. When feeding them to hens, and cows giving milk, the seeds should be removed, as they have a diuretic effect, which tends to dry up the milk, and cause hens to cease laying. I think squashes are worth half as much a ton to feed as good hay.

Varieties.

I. SUMMER SQUASHES.

Summer Crookneck. This is very early, productive, and of fine flavor, and is the standard for an early kind.

Yellow, and *White Bush Scalloped.* These two varieties are alike, excepting in color, and are early, scallop-shaped varieties. They are extensively cultivated at the south, for shipping north. In New England they are not as popular as the Summer Crookneck.

II. FALL AND EARLY WINTER SQUASHES.

The *American Turban* stands at the head of this class. It is the largest and most productive squash I know, excepting the mammoth varieties, which I do not consider much better than the pumpkin. Some specimens are as sweet and dry as the Hubbard, and the flesh is usually finer grained and of a better color, being of a bright orange, and free from green streaks. It is not as uniform in quality as some kinds, some specimens being light colored, insipid and watery, but when you get a good one you have a superior table squash.

They are a soft-skinned variety, of yellow color, in form somewhat like a peck measure, with a peculiar acorn-shaped mark at the calyx. In some specimens this acorn is quite prominent, standing out boldly from the squash. In selecting seed of this variety, I have always discarded those in which the acorn stood out very much, yet I would have the mark quite distinct, but not very prominent.

Cocoa-nut Squash. This is an excellent little squash. It is very prolific and grows somewhat in clusters, but the fruit is so small — about the size of a cocoa-nut — that the weight of the crop is quite light. It is the handsomest of all the squashes, being spotted all over—one end bright yellow and orange, the other dark and light green, the division between green and yellow being even and straight around the squash, giving it the appearance of parts of two different colored squashes joined together. The flesh is fine grained, sweet, and very dry, and of excellent flavor. It is too small for general cultivation, but for small families, which cannot use the whole of a large squash at once, it is more desirable than if it were larger.

Boston Marrow. This is a very popular fall squash, of a bright orange color, and is probably more extensively raised by market gardeners than any other variety. I do not like it, and do not consider it worthy of cultivation as compared with the Turban.

III. WINTER SQUASHES.

Hubbard. This is the standard winter squash. Pure, well-ripened specimens are of a brownish green color, with a shell of flinty hardness. The flesh is very sweet and dry. It is an excellent keeper, and is too well known to need any extended description.

Butman. This is a new squash introduced by Mr. Gregory, in 1875. It is a hybrid, originated by Mr. Butman, of Maine, and was produced by crossing the Hubbard with the Yokohama, and certainly is an acquisition. I consider it the best winter squash yet produced. The Hubbard is the standard at the present time; but there are some points in the Butman which I think are an improvement on the Hubbard. It is sweeter and finer grained; handsomer and more attractive. The outside is of a beautiful green with white spots, and the flesh is a sort of lemon color; being lighter and more delicate than the Hubbard, or most of the popular sorts, and entirely free from those green streaks which are found in the flesh of the Hubbard, next to the shell, and which injure its appearance when served for the table. The shell is as hard as the hardest Hubbard, and when quite ripe is often somewhat warty. It seems to be a little later than the Hubbard; the vines remaining green after the other kinds are dead. They do not grow quite so large as the Hubbard, but they set more thickly on the vines, and will probably produce as much weight per acre. My largest specimens this year weighed ten pounds, with the same cultivation as produced specimens of the Hubbard weighing eighteen pounds. The Butman may be called a *pure bred* squash, being remarkably uniform in color and quality, proving it to be a variety of established purity, which it is difficult to obtain in the squash family, and which, when attained, requires great care to preserve.

Marblehead. This is a new squash, introduced a few years since by Mr. Gregory. When ripe it is covered with a hard shell similar to the Hubbard, but of a bluish green color. It grows a little larger than the Hubbard, and the flesh is brighter colored and freer from green streaks, with a flavor very much the same. I have tried

it but do not like it, and have abandoned its cultivation. It is too late, and has too many seeds and too little flesh, being almost as seedy as a pumpkin.

Yokohama. This is a variety from Japan; it is flattish in shape, deeply ribbed, and greenish colored, turning yellow when quite ripe. It is recommended as a good squash but I have never tried it.

Winter Crookneck. This is an old fashioned squash; it is excellent for pies, one of the best of keepers, and still has its friends; but I do not consider it as worthy of general cultivation.

Melons.

The cultivation of melons is very much the same as that of squashes. Yet there are some points of difference which should be briefly noticed.

Melons require a warmer and lighter soil than squashes. They will grow on poorer land if it is only early and warm. The manure should be mostly applied in the hill, and of a more heating nature than for squashes, while they will not require so much spread on. All green, coarse manure should be avoided, as it will produce too much vine and delay the setting of the fruit too long. Use hen manure, guano, animal fertilizer, or composted night soil and stable manure. They should be planted nearer together than squashes—five feet apart being about right. They will not bear so deep planting as squashes—from three-quarters of an inch to an inch and a half is deep enough. Plant ten or twelve seeds in each hill, and thin to half that number. Watermelon seeds should be soaked in warm water two days before planting, to hasten germination, as they are very slow about coming up.

When one's soil is cold, melons may sometimes be raised by filling a large hole with compost, and covering it with soil, in which half its bulk of sand is mixed. A little sand used this way will help them very much. Frequent cultivation and hoeing is very essential, in order to hasten their growth.

When Should the Fruit be Gathered? This is a very important matter, for a green melon is worthless, and they will spoil very soon after they are ripe. The ripening of muskmelons may be readily detected by the change of color, and by the separation of the stem from the fruit, if ripe; but if green it will hold quite strongly, and finally break if forced. It is more difficult to tell when a watermelon is ripe, but an experienced grower will readily detect the ripe

ones by the sound they give when rapped upon. Green watermelons sound hard and solid, while a ripe one has a dull, hollow sound, but this is one of the things that must be learned by practice.

The varieties of melons are almost endless, but the following are a few of the most popular sorts.

Muskmelons.

Casaba. A very large, deeply ribbed and oblong shaped melon. The flesh is greenish colored, very sweet, and of superior flavor. It is the best muskmelon I have ever raised. I consider it worthy of general cultivation.

Ward's Nectar. This is a small round melon. It is very sweet and of delicious flavor.

Yellow Cantaloupe. A medium sized, round melon. The outside is yellow and slightly ribbed, while the flesh is salmon colored and has more of the peculiar musk flavor than most kinds. It is quite early.

Green Citron. This is a round melon, deeply netted with green; flesh of rich, delicious flavor.

Sill's Hybrid is a very early and sweet melon; flesh salmon colored and of excellent flavor.

Watermelons.

Phinney's. This is an oblong shaped melon; the outside is spotted, but quite dark colored. It is very solid, and the seeds are white excepting at the eye. The flesh is bright red, very sweet and juicy, with a very thin rind. It is very productive and worthy of general cultivation.

Mountain Sweet is an old standard sort. It is long shaped, dark green, with dark seeds. The flesh is sweet, solid, and delicious.

Mountain Sprout is a large, long, striped variety, with drab colored seeds. It is very productive and sweet.

Black Spanish. This is a dark green, small, round melon, very sugary; it is recommended for private gardens.

Sculptured Seeded Watermelon. A new variety from Japan. It is round, dark green, and of medium size. The flesh is cream colored and very sweet. The seeds are dark colored, with singular marks on them, resembling Oriental characters.

Discussion.

O. B. Hadwen said that he had been much interested in the description of new varieties. He agreed with the essayist in regard to the depredations of insects, but he would pinch off the heads of the black bugs instead of collecting the bugs in a pail.

Mr. Pierce said that the bugs would not crawl out of the pail. It was thought by some that the odor caused by crushing them in the field would attract more bugs; for this reason he preferred to carry them off the field and scald or burn them. He did not doubt the existence of the borer, though he had never been able to find one himself. He had never tested the Butman squash before the last year, and, although his Hubbards were rotting some, he had found no specked Butmans.

Mr. Hadwen said that the black bug lays its eggs in clusters on the under side of the leaf, where they hatch in a few weeks. Before being hatched they may easily be destroyed by pinching them, thus diminishing the number of insects the following season and preventing injury to the squashes in the autumn. This bug often punctures the vines near the surface of the ground, thereby destroying them. The borer has never given much trouble in Worcester county.

E. W. Buswell said his experience had been that the black bug injured the foliage.

John B. Moore thought that there would be but little difficulty in raising squashes, if we could get rid of the insects. Among other insects which infest them is the blue louse, which is found on the roots sucking out the juices. He had seen a short, white grub in the vine.

George Hill said that different locations would require different treatment. He was doubtful whether the black bug did as much injury as it is reported to do. He had seen a whole field cut down by the borer. Some years, with the utmost pains, you cannot get a good crop of squashes. He manures broadcast, but more heavily in the places where the hills are to be. The roots will run twice the length of the vines; they are gross feeders, and will be sure to find the manure.

He found it difficult to keep the varieties pure. He could select seed of the Mountain Sprout watermelon so as to bring it to the Black Spanish, and *vice versa*. He had selected the seed of a green flesh melon, originally from New York, so as to bring it a fortnight earlier, but while doing this the quality deteriorated. The musk-

melon also can be grown in any direction; he had got one up to thirty-seven and a half pounds, and three weighed a hundred pounds. These did not deteriorate. The case is the same with all vegetables, and Mr. Hill thought that sufficient attention was not paid to the selection of seed.

Mr. Pierce said that the method of manuring recommended by him was adopted because his soil required heat. He did not mean to say there was any connection between the borer and the black bug, but only to say that they both produce the same effect. He had noticed hills wilting when there were no bugs to be seen on them, but he usually found dry leaves near the root, which indicated that they had been there. He thought half a dozen black bugs would make a vine that had run ten feet, wilt. He never found a vine that had been attacked by black bugs that did not wilt in a hot sun.

J. S. Richards had found, in every instance where vines wilted, some trouble at the root—either blue lice, or rust, or some other cause of injury to the health of the plant. The cause might be in the manure.

E. W. Buswell suggested that a vine growing in a manure heap often produced more squashes than half a dozen vines in the field, so that the injury could hardly be from the manure. Perhaps the vines were attacked by microscopic insects.

Mr. Richards did not believe that you could give a squash too much manure, if of the right kind; but thought the plants might be injured by unsuitable manure. Maggots might do mischief, but he had always found the root diseased.

Mr. Pierce had found small white maggots at the roots of vines. A vigorous vine might survive the attacks of the black bug for some time.

Mr. Hill said that of late years he had paid no attention to the black bug, but that he did make a business of examining his vines for borers two or three times a week. He found them by cutting, and had sometimes traced them for a foot. He put dry earth over the wounds, and if a quarter of the stem was left the vine would grow and heal; if covered with wet earth it would rot. He had had fields where the borers were as plenty as ever were seen, and no vines wilted. If the black bug was not poisonous to the vine, he did not think the sap drawn out by them would injure it. He had seen young vines attacked by the black bug, which continued to grow vigorously and ripen fruit.

Mr. Moore thought it best to spread the manure, if you manure highly. The plants send down roots at every joint, and when the main root was destroyed these roots would often enable the plant to carry a full crop. This was an argument for spreading the manure broadcast.

Mr. Pierce said that he spread part, as recommended in the essay—eight cords to the acre—and used a shovelful of dry hen manure in the hill.

Mr. Hill would not apply hen manure without composting. He thought a shovelful of clear hen dung in a hill would destroy the seed.

Mr. Pierce said that last year he applied a shovelful in the hill with good effect. He was careful to cover with an inch or more of soil, making a hill a foot and a half broad.

MEETING FOR DISCUSSION.

SATURDAY, January 20, 1877.

William C. Strong, Chairman of the Committee on Publication and Discussion, presided, and introduced George L. Goodale, Assistant Professor of Vegetable Physiology in Harvard University, who delivered a lecture, of which the substance is here given, on

FERTILIZATION AND CROSS-FERTILIZATION.

Professor Goodale commenced by describing the structure of a flower, which he illustrated with a large model of a pink, showing first the axis; next the bracts or modified leaves surrounding the lower part of the calyx, but affording no great degree of protection; then the protecting organs—first the calyx or cup—the word calyx being derived from a Greek word signifying "cup;" and second, the corolla—the name of which is of Latin derivation, signifying "crown" or "garland." All these and other organs of the flower are modifications of leaves. For the recognition of this principle we are indebted not to a professional botanist but to the poet Goethe. It gave us a clue through all possible labyrinths of form, and led to the study of morphology—the science of form—which has been called the soul of natural history.

Within the enveloping organs we come upon an entirely different set of modified leaves—the stamens, each consisting of a stalk or thread, having at the summit the essential part, a case or anther containing pollen. This pollen can escape in several ways; in the flower under consideration it escapes by a little slit in the anther. The form of the pollen grains is generally spheroidal; in the cucumber the pollen grains are nearly spherical, and covered with protuberances. In the evening primrose the pollen grains are of irregular form. These various forms were illustrated by the lecturer on the blackboard.

Owing to their minuteness we have no means of mechanically dividing these grains for examination by the microscope, and they must be broken up by chemical means. We then find that they contain a tiny mass of protoplasm, with a little food consisting of starch and oil.

Next we come to a pod containing immature seeds or ovules. The ovule of a lily was sketched on the blackboard, and shown to consist of a central nucleus surrounded by integuments. One of the cells of this nucleus is larger than the others, and only partly filled with a substance shown to be protoplasm, similar to that in the pollen grain. Here we have two reciprocals; by their interaction is produced a fertilized germ, capable of growth. The lecturer here remarked that he should confine himself to established facts, and not enter upon any debateable ground.

When a grain of pollen becomes attached to the stigma, or upper part of the pistil, and begins to grow, a very curious phenomenon is observed. This was illustrated by a sketch of the pistil of the shepherd's purse, which has a sticky surface at the upper part, and a row of ovules in the ovary below. The pollen grain receives the moisture of the pistil and sends down a tube, or long cell. At first this grows at the expense of the food stored up in the pollen grain itself; but afterwards, like an invading army, which lives upon the country conquered by it, it receives food as it goes along. The tube extends with greater or less rapidity, and the tip of this long cell passes through the aperture in the ovule, and the contents of the pollen grain are blended with the embryo. Up to this point there is no change in the ovule, and in some plants, such as a few orchids and certain species of the heath family, like *Monotropa*, it is left in a rudimentary condition. But in a vast majority of instances there is a great change; in the shepherd's purse and buck-

wheat, there is a line or partition formed through the protoplasm; cell multiplication takes place; the whole enlarges and constitutes a germ. The two kinds of protoplasm have contributed to the formation of an entirely new individual, and we have a seed—an embryo plant with a supply of food, the whole protected by integuments. The lecturer remarked that the old analogies between plants and animals in regard to fertilization can now be all thrown aside, while between the fertilization of the higher and lower plants there exist not only analogies but homologies, in an almost unbroken, though not a straight line.

After a recapitulation of the essential parts of the flower, and the remark that the outer parts were not merely protective, but often exercised the function of attracting insects, the lecturer proceeded to the second part of his subject, viz., the means whereby cross-fertilization is secured. This is one of the most fascinating parts of vegetable physiology. In the latter part of the last century a book was written by Conrad Sprengel, on the intervention of insects in fertilizing flowers. Sprengel read the puzzle rightly, concluding that in the greater number of cases there is some provision, by insect or other agency, to prevent self-fertilization; but at that time botanists were studying plants in their relations to each other, and classifying them by means of dried specimens; and his researches in regard to living plants were overlooked. Early in the present century the object of this provision was discovered by Thomas Andrew Knight, the eminent English horticulturist and physiologist, to be the keeping down of all vagaries, and the prevention of deviations from the parent type. Attention was called to this subject again in 1858 and 1862, by Charles Darwin, who was convinced that occasional cross-fertilization is the rule and not the exception. In a work lately published in England, and soon to be reprinted in this country, he gives the results of eleven years' practical research in regard to close and cross-fertilization. By experiments with the morning glory, and other fast growing plants, he found that self-fertilization, even when effectual, produces, in general, less vigorous plants than cross-fertilization.

The lecturer then demonstrated the means by which cross-fertilization is secured. This portion of the lecture was illustrated by diagrams; first of the *Aristolochia* or Dutchman's pipe, in section, showing the position of the anthers and stigma to be such that self-fertilization is impossible. In the common plantain the lower

flowers bloom earlier than the upper, the latter having the stigmas protruding and having at the same time the stamens tucked away in the corolla where they cannot fertilize the stigmas. The anthers mature later than the stigmas. Unless fertilized, the stigma droops, and the stamens then protrude, so as to be ready to fertilize the stigma of another blossom or another plant. The question arises how pollen can be carried from one flower to another. In the plantain it must be by the wind, for the flowers are not attractive to insects, and for the same reason all grasses and sedges are cross-fertilized in this way. The *Houstonia* grows in little patches, and it is found that in some of these patches all the flowers have protruding styles and anthers low down; while in others all the flowers have short styles, and anthers high up in the throat of the corolla. The flowers of the former cannot fertilize themselves, but must be fertilized by the other kind. The pollen of many flowers is not so potent to fertilize the ovules of that flower as the pollen from other flowers of the same species. This has been well stated by Professor Gray, as follows: — "In the blossoms of peas, beans, etc., generally little or no seed is set when insects are excluded, although the parts are so disposed that the stigma must be dusted by the pollen of the stamens enclosed with it; when, however, such stigmas are touched by the pollen of another flower it seeds perfectly." In the madder, cinchona, and ipecac, the structure of the flowers is similar to that of *Houstonia*.

In the case of ipecac plants raised in greenhouses, seed very rarely if ever sets. Professor Balfour was led to suspect the cause, and he found plants of ipecac in the other dimorphous state—that is with reciprocal styles—and by fertilizing one form with the other, fruitful seed was produced. *Lythrum Salicaria* presents an example of trimorphism, the stamens and pistils having *three* different lengths with regard to each other and to the styles, and necessitating the action of insect agency. The arrangement in the *Scrophulariaceæ*, including the *Gerardia*, and also in the *Gloxinia* and other gesneraceous plants, is the same as in the plantain, but these have the addition of color to attract insects. One of the most remarkable provisions to ensure cross-fertilization is seen in the *Clerodendron*, so well known in our greenhouses. When the flowers first open, the long styles are curved back and the stamens are straight, but afterwards the stamens curve back, and the style straightens, and the ovules cannot be fertilized by the pollen of the same flower.

In the *Kalmia*, or mountain laurel, the anther is in a pocket and held down so that the filament is bent, and when released the pollen escapes through an opening at the top. The effect is similar to that which might be produced by a boy fastening a case of shot on the end of a whalebone rod, and then bending the rod and suddenly releasing it. At first sight this arrangement might appear well adapted to secure the fertilization of a flower by its own pollen, but it is found that the pollen generally shoots clear by the stigma. When, however, an insect alights on the flower and covers the stigma, the under side of his body takes the pollen, where it is ready to be imparted to the stigma of the next flower on which he lights. That the pollen of this plant is not very potent in self-fertilization was shown by Professor Beal, who covered up a plant with gauze so that no insect could get to the blossoms, and in this case no good seed set. The barberry presents a well-known case of sensitiveness in the filaments. The lecturer called attention in passing to the curious fact, that by the application of chloroform the stamens lose their sensitiveness; the same is true also in the sensitive plant. When an insect alights on the barberry, the stamens fly up, the anthers open by trap-doors, and the pollen comes side foremost and falls on the insect instead of on the stigma. This was noticed by Sprengel, who also observed that the barberry was visited generally by sluggish insects. In the common iris, the pollen is below the stigma, and the insect in its search for nectar carries off the pollen from the anther to another flower.

But the most remarkable contrivances for ensuring cross-fertilization are found among Orchids. These are so numerous and so curious that Darwin has written a book on the subject. A species of *Habenaria* has a broad lip with an open space, on each side of which is a case containing a packet of pollen. The nectar is at the bottom of a long tube or spur, down which the insect must reach to obtain it, though some insects have become so lazy as to shirk this duty and open the base of the tube, and the same operation has been noticed in the columbine. In reaching down the tube the head of the insect comes in contact with two sticky discs, which fasten themselves to his head, and he flies with them to another flower. When these discs first attach themselves to the head of the insect, having been in a moist place the pollen-masses are damp and project from his head, but soon dry and curve downwards and forwards. The insect flies to another flower, and in seeking to

extract the nectar he places the two pollen-masses on its stigma. In the large green orchis this process can be performed with a pencil, instead of the proboscis of an insect. The two pollen-masses will adhere to the pencil, and it will leave them on the second flower and take away two for the third. In the *Cypripedium*, or lady's slipper, the insect enters a large sac so fortified that he must take a roundabout road to escape. *Cypripedium venustum* sets for insects a trap, baited with nectar. In their effort to escape, the insects detach pollen and carry it away with them to another blossom.

As the apparatus for the fertilization of orchids is more remarkable than that of any other flowers, so that of *Catasetum* is most remarkable among orchids. In this genus a part of the flower is drawn down like a spring trap, and in a warm room these stalked masses of pollen when liberated will turn a somerset, suddenly hitting the object which touched the hair trigger. If the hand is placed on this part of the flower and instantly withdrawn, the pollen will be received on the hand.

Hybridization extends beyond the limits of the species. Cross-fertilization is confined within the limits of the species, and its object is the suppression of those vagaries which we see in varieties.

The lecturer concluded by citing Mr. Darwin's general proposition relative to the subject, namely, that many plants cannot be self-fertilized. In those which can be and are self-fertilized as a rule, there is provision also for occasional cross-fertilization.

MEETING FOR DISCUSSION.

Saturday, January 27, 1877.

W. C. Strong, Chairman of the Committee on Publication and Discussion, presiding. Byron D. Halsted, M. S., of the Bussey Institution, Harvard University, was introduced and read the following lecture on

Injurious and other Fungi.

From the early days of botanical science, the vegetable kingdom has been divided into two grand divisions, namely: *Phœnogamous* or flowering plants, and *Cryptogamous* or flowerless plants.

It is unnecessary for us to point out illustrations of this first great group, because they are as familiar to us as household words, in the trees which spread their lofty tops above our heads, or the grass which grows in the meadows and pastures at our feet. With the cryptogams the case is somewhat different. The *Ferns*, the royal members of the cryptogamic series are, with us, only herbs of yearly growth; while *Mosses* and *Lichens* lay but a carpet on the rocks and hillsides. The *Sea-weeds*, though certain species grow large and cumbrous, are usually small, and many are microscopic, and *Fungi*, the last of all, are too often known to the natural sight only by their effects. It is to a consideration of some of the members of this last mentioned group that your attention is invited.

Fungi make up a group so diversified in characteristics that it is almost impossible to give any description of them as a whole. Suffice it to say, they are all parasites, deriving their nourishment directly from the organic substance upon which they feed, having no green leaves in which crude material can be transformed and fitted for the growth of the plant. They are all thieves, then, either stealing their sustenance from the dead, or robbing the living tissue of all its vital fluid.

Their range of growth is limited only by the boundaries of other forms of life. The housewife, to her great dismay, finds upon the top of her can of fruit a portion that is white and worthless; a plant has found its proper element and has been feeding upon her dainties. Your wine may have leaked from your cask to the cellar floor, and when you go to draw a draught, a carpet of the finest velvet has grown for your feet. Yeast is employed to make our bread light and wholesome; and myriads of little plants do the work and do it willingly. Fungi flourish upon our walls, find their way through our books, and pick to pieces the frame work of the stoutest ships. The animal kingdom is not beyond their reach, and many of its members fall victims to an overpowering vegetation; while it is a well-established fact that many of the most fatal epidemics are the result of their inroads upon the human family. Without further generalization, which is almost worthless in such a group as this, let us pass at once to the consideration of some of its individuals.

In the Mushroom, *Agaricus campestris*, perhaps as well known as Toadstool, we have a species of fungus with which every one is familiar. It is the famous *Champignon* of the French, the *Patiola* of the Italians, and was known to the ancients by upwards of a

score of synonyms, growing almost everywhere, from the chilling atmosphere of Lapland, to the hot climate of the tropics; from the Japan islands on the east, to California on the west. Though it is by no means confined to old pastures, with us it is to be found there in the greatest abundance, and especially after a warm shower in the evening. The rapidity of its growth is proverbial. If we go out in the morning we may see them in clusters exhibiting all gradations, from the young "buttons," resembling eggs in size and color, to those of middle and old age, consisting of a stalk somewhat larger than a man's middle finger, bearing at the top a broad, umbrella-like expansion, which is called the *pileus*. When young, the outer edge of the pileus is united with the stalk, but as it approaches maturity it breaks away, leaving the *ring* to mark its former place of attachment. If a full grown mushroom is taken, and the under surface examined, it will be found to consist of a multitude of radiating gills of a beautiful pinkish color. It is on the surface of these gills that the reproductive bodies are borne—bodies which, though different in structure, perform for this plant the same office the acorn does for the oak; but instead of being called *seeds* they have, in this and all other species of fungi, received the name of *spores*. At the base of the stalk, hidden from sight, is to be found a mass of fine threads which make up the true vegetative portion of the fungus, and is called the *mycelium*—a term applied to this part of all species of fungi. In France, where the satisfaction of the palate is a matter of no secondary consideration, the mushroom has received the greatest care, and been quite extensively grown. In this peculiar market gardening, caves are often put to valuable use; and old deserted mines have been appropriated for the winter culture of the champignon. The growth and consumption of the mushroom in the United States is rapidly increasing. In Italy this species of fungus is always rejected in the markets as being poisonous, while its place is filled with another upon which the French look with distrust.

The fact that some species of toadstools are poisonous, is as evident as that others possess real worth as articles of diet, bearing, as it does, the testimony of many who have ignorantly eaten of the former, supposing them to be edible. Among the illustrious who have perished in this manner, we find the names of the Emperor Jovian, Pope Clement VII, and the Emperor Charles VI. The dread of being poisoned, mixed with no small amount of super-

stition, together with the difficulty of distinguishing the good from the bad, have all combined to prevent the accordance of justice to this family of plants.

Any one who presumes to give instruction concerning fungi is expected to lay down certain infallible rules for distinguishing the edible from the poisonous, so that in the future no serious inconvenience or loss of life may arise from their injudicious consumption. Up to the present time this has never been done, and it would not become me to attempt it here. There are certain *general* rules which may be given, but they all have their exceptions, both in including poisonous species and in excluding those which experience has shown to be delicious.

Those which are bright colored, as red, blue, or green, are to be looked upon with suspicion. Those which change color when bruised, cut, or broken, are usually unfit for food. A milky juice is a bad sign. Those with a moist, waxy surface, are to be avoided. A disagreeable odor while still fresh is a *strong* indication of their not being edible. But, as has been stated, these rules are not infallible, therefore a last safeguard must be laid down, as follows: *never eat a fungus about which there is any doubt.* The best and shortest method for those who wish to make use of these plants as articles of diet, is to become acquainted with the distinct characteristics of a few of the most common edible species, and use no others.

One of the leading fungi recognized as valuable for food is the Morel (*Morchella esculenta*). It has a short, thick stem, terminating in a large ovoid top, very irregular on the exterior, owing to the many compressed folds of which it is composed, thus forming a surface of numerous indented polygons. They are found to some extent in most countries, but those in commerce come almost entirely from the states of Germany. They show a peculiar preference for those portions of woodland, on sandy soil, over which fires have passed. This fact became so evident to the peasants who gathered them, that in order to increase the range of growth they set fire to the forests to an alarming extent, and rigid laws were enacted to prevent such damage. The morel is extensively used as a flavoring for sauces and soups, but chiefly in the manufacture of one of the finest qualities of catsup.

The most highly prized of all edible fungi are Truffles, of which there are several species, the most common one being *Tuber æsti-*

vum. They are roundish in outline, of the size of a black walnut, having the surface black and much wrinkled, as if by pressure. The interior is quite solid, of a brownish color, and exhaling when cut a very agreeable odor. Their habit of growth is peculiar, as they are subterranean during their whole life, being buried beneath the soil to the depth of several inches. The condition most favorable for the growth of truffles is a soil of a calcareous nature, permeated by the roots of the oak; and the method pursued in France, the only country where the culture has proved successful, is to select the required quality of soil and sow it with acorns. When the saplings have attained a few years' growth the truffles begin to grow. Owing to the subterranean habit of the truffle, the difficulty of finding them, when growing in the wild state, is great, and to this end several processes are in vogue, one of which is quite effectual, and at the same time unique. Dogs and pigs are very fond of these delicate bits of vegetable growth, and being endowed with a sense of smell far superior to that possessed by man, are enabled to seek out the truffles in their hiding places. When the dog, or pig, as the case may be, has found the locality of the plants, he is repaid by a more available, though less palatable morsel from the truffle-hunter's hand.

Besides those already mentioned, there are many other species of fungi which have won a general acceptance into the list of those that are fit for food.

Among the poisonous toadstools the *Amanita muscaria* holds a leading place, receiving its specific name from the fact that it is sometimes steeped and the solution used in the destruction of the house fly. The pileus is raised on a long stalk, and often attains the diameter of four to six inches, having its upper surface studded with large white protuberances, making the plant, if richness of color and beauty of outline are considered, better fitted for the throne of a fairy than the stool of an ugly toad. Though so tempting in its beauty, its poisonous effects have become well understood through the sad experience of many who have eaten freely of its tender tissue, to suffer the severest pain, sometimes only relieved by death. A variety of this species grows to some extent in Northern Asia, and especially in Kamtchatka, where it is highly prized by the natives for its exhilarating effects, possessing, as it does, the power of producing a peculiar intoxication. The fungus is gathered and dried with great care, and when a state of inebriation

is desired, a small piece is swallowed, and in the course of one or two hours the drunkard is in his glory. This fungus has a peculiar effect over muscular exertion. In his "Vegetable Kingdom," Dr. Lindley tells us that a talkative person, under its influence, cannot keep silence or secrets; one fond of music is constantly singing, while he who wishes to step over a straw takes a stride sufficient to clear the trunk of a tree.

With us the *Phallus impudicus* is the most disagreeable species, and commonly bears the not over-classic name of Stinkhorn. It has a stalk five to eight inches in length, bearing at the top a small cap, which, when young, is covered with a green slime. This soon liquefies, and dropping off, covers the ground with an offensive mass, to be eagerly sought for and devoured by carrion insects. The top, when thus relieved of its green outer covering, exhibits a honey-combed surface, and exhales the most disgusting of odors. Many stories are told of the encounters botanists and others have had with this peculiar plant. A case is related of an enthusiastic botanist, who, while on a tour, found some of these plants of unusual size, and wishing to preserve them, placed them in his box; returning home by rail they caused such discomfort to the inmates of the car that every occupant left it with amazement and disgust as soon as possible.

Let us now turn our attention to some of those smaller members of this assemblage of plants, which more truly deserve the name of *Destructive Fungi*, and therefore fall more particularly within the province of this lecture.

The bread, cheese, and cake moulds, though belonging more strictly to household economy, are not without their influence upon the fruits of the horticulturist, and for this reason warrant a passing mention here. They only grow upon organic matter after life has become extinct, but in their growth they rapidly hasten decay, and in this way often do serious damage to fruits and vegetables. An explanation of the cake mould, *Eurotium Aspergillus glaucus*, will answer for them all, though among these little plants great differences are to be observed. The general appearance of this little blue intruder is so familiar to you that a description of it as seen by the naked eye is unnecessary. Under the microscope, the little specks resolve themselves into small heads of radiating cells. These cells are formed one upon another from the filaments, and are spores, but of that kind known as conidial or asexual spores. On

other *mycelial* threads, at the base of the stalks bearing these conidial spores, the true sexual spores are produced in something like the following manner: Certain filaments first begin to coil up into a close spiral, after which another thread grows up and touches the tip of this coiled filament, and fertilization takes place, a process essentially the same as the pollenization of the ovule in flowering plants, though differing in method and results. After this fertilization, sacs or cells arise from the coil, in which spores are formed, and the whole coil and sacs of spores become surrounded by a covering of cells. On account of the sexual spores being borne in these sacs or *asci* this fungus comes among the *Ascomycetes*, one of the highest groups of fungi.

We come now to speak of species of fungi which flourish on living tissues, and on these only, including, therefore, the most destructive members of the group.

Puccinia Graminis, one of the most widely distributed and generally known, is one of the many species of that destructive agency which is often vaguely spoken of as Rust. All agriculturists who have made the raising of grain their leading employment, will at once turn in thought to the time when their whole field of growing wheat or oats, the pride of their vocation, was turned, as by the stroke of some unseen demon, into a yellow, premature old age.

The different stages in the growth of this plant are quite distinct and peculiar, and though somewhat complicated, it would not be justice to the plant or to science to omit the history of the forms through which the rust plant passes from the perfect state to the perfect state again.

The transformations in the life of a butterfly are so evident that the merest schoolboy may observe the truth for himself; but with the rust plants the objects are so very small that the changes can only be seen by the keen eyes of a skilled observer, with the best powers of the microscope. Beginning with the spores of the mature rust plant, as seen in the black stains on the old stubble of any grain field, it will be found, when the warm and moist days of spring come, that these spores germinate, producing in a few days a short stem, bearing a crop of other spores of very much smaller size. To avoid confusion we will call these by their scientific name—*sporidia*, while the parent spores are styled *teleutospores*. The sporidia have never been known to grow upon the grass or grain; but when they find their way to the leaves of a barberry bush they soon begin to

germinate, the filaments enter the tissue of the leaves, and in the course of a few days make themselves manifest on the under surface of the leaves, in what are known as "cluster cups." The interior of these pretty little cups is closely packed with spores of a still different kind, which are called the *æcidium* spores. These in turn will not grow upon the barberry, but when they fall upon a blade or stalk of grain, they soon germinate and produce the yellow, rusty covering so often seen, caused by a multitude of another form of spores, called *uredo* spores, clustered upon the surface. In this, the true rust state, the fungus first consists of minute filaments, which run in all directions through the tissue of the grain plant, stealing its nourishment as they go, and is noticeable to the naked eye only when these threads break through the epidermis and bear the yellow or orange uredo spores. The rapid and destructive development of this fungus depends much upon the weather. Should there be a series of warm showers, or a muggy atmosphere, just at the time the grain plant begins to form its grain, the growth of the rust plant is especially favored. It absorbs rapidly the food which is on its way to the seeds, and uses it up in producing a vast number of spores upon the surface of the leaves and stalks, at the expense of an empty head of husks at the top. Later in the season, from the uredo state the final perfect teleutospores are produced, thus completing the circuit of life in this little rust plant. Long before rust was discovered to be a plant, farmers had noticed that there was a close relation between it and the barberry; and at present the latter is being rapidly destroyed, with good results, though it can scarcely be expected that the rust plant will thereby become extinct, as probably the æcidium state grows on other plants than the barberry, though not as yet discovered elsewhere.

This plant is an excellent illustration of polymorphism, so common among fungi, and it also answers well to show the vast number of spores these microscopic plants produce. The teleutospore usually bears from five to ten sporidia; and allowing only one of these to find the barberry leaf, there may be from one to fifty clusters as a result. In this case suppose only one, and a very low estimate for its contents would be 250,000 æcidium spores, and if only one of these in a thousand finds a place on the grain stalk, and each brings forth its 250,000 fold, there would be, under such circumstances, 62,500,000 from the single one from which we started. Taking the same teleutospore, and supposing every spore in all the stages found

its place to fill it, the result would be 1,562,500,000,000,000,000 (one quintillion, five hundred and sixty-two quadrillions, five hundred trillions) spores, which may be looked upon as its descendants for the season. Or giving each inhabitant of the globe his equal share of these reproductive bodies, he would have nearly as many as there are individuals in the whole human race. This may seem like a very large story about a very small matter; but it is not the only wonderful truth the microscope has revealed.

It is much easier to tell in what rust consists than how to avoid it. Knowing the nature of the plant, and that in one of its stages it grows upon the barberry, the cutting away of all barberry bushes may do much to check this unwelcome pest, if not to improve the landscape and the general appearance of the farmers' boundary lines. As to the best time to sow a crop to avoid the rust, little information can be given. Sow when you would expect the best returns were there no such thing as rust. Many trials have been made of soaking seeds in various chemical solutions before sowing, but, from the nature of the parasite, little good is to be hoped for from such a practice. Until the weather is under man's control we cannot hope to eliminate the conditions for the rapid development of rust, causing, as it will, a partial or entire failure of the grain crop.

The *Ustilago maydis*, generally known as Corn Smut, is another of these microscopic plants which often grows in fields of maize. Though less prevalent than the rust, it is, like that, a sworn enemy of the agriculturist. Sometimes it makes its appearance only at one or two of the joints, causing a bending, so that the stalk frequently reclines on the ground. Again, it seems to take possession of the whole plant while it is still quite young, and as a result there is only a dwarfed and rotten mass, but a few inches above the surface of the soil. The greatest damage is done when the thief takes possession of the kernels while they are still quite young, transforming their tissue into its own long mycelium threads, which at maturity produce, in infinite numbers, the minute blackish spores. Frequently, only a few of the grains are affected, making a striking contrast with those of natural size. It was long supposed that this smut was a diseased state of the corn plant; but there is no longer reason to doubt that it is a small, dirty plant, growing at the expense of one of the most useful members of the vegetable kingdom. Vegetation and reproduction in these plants are reduced

to their simpler forms, and the space from the time when a spore germinates to the time when spores are again formed may be reduced to weeks, and even days, instead of being months and years as in plants of a higher and more complex organization. The grains of corn that, to the naked eye, appear perfectly free from the smut, may have their tissue interwoven with its mycelium threads; and when the grains thus affected are planted, the fungus is planted with it, and as the corn plant grows so does the parasite, until the presence of the latter becomes evident in its black, dusty fruitage. This is one of the methods of propagation which is of great importance to the existence of the smut plant. As with the rust, there seems to be no available method of staying its ravages when moist and warm weather comes at just that season of the year best fitted for its rapid development. Still, much could be done to reduce the number of its reproductive bodies, by cutting off and burning the affected portions before the smut plant has ripened its spores. Concerted action is required in a movement like this; and when farmers, as a whole, see that it is for their interest to go through their fields of growing corn, and destroy this pest in its early stages of growth, we can assure them that from that day on they will have more and better corn for their labor.

In all cereals to some extent, but especially in the rye, may frequently be found a fungus which has long been known under the name of Ergot (*Claviceps purpurea*). Like the corn smut, this plant attacks the young grain and causes it to assume a very much enlarged form, protruding far beyond the husks and resembling a cock's spur, whence its common name "spurred rye." The whole enlarged mass is made up of hard mycelium, on the surface of which the conidial spores are borne. The fungus may exist in this indurated form for a long time without further development, but when these ergot grains fall upon moist earth, sprouts soon proceed from them which form club-shaped heads at their extremities, in which spores of the second form are produced in little sacs. These different forms were for a long time considered distinct species; but the hard state, that in which ergot exists as sold in the shops and used in medicine, is only a form which many fungi have the power of taking on when they prepare for a season of repose. Ergot is one of the most poisonous of the smaller fungi. In several provinces of France and Germany, epidemics of nervous derangement, resulting in gangrene and frequent loss of limbs and even of life, have

been traced to the consumption of this plant in the bread made from rye which was largely spurred, the result of an extremely favorable season for the growth of this pernicious fungus.

It is to be presumed that no one species of plant has caused so much suffering to the human family as *Peronospora investans*, or Potato Rot, as it is called in common parlance. Those of you old enough to glance back in memory to those fatal years for Irish peasantry, when their almost sole source of sustenance was swept from them by the ravages of the rot, can form an idea of the influence even a microscopic fungus can exert over the comfort and civilization of the race. The potato rot is one of those small microscopic fungi best known to the naked eye by its terrible effects. Its first general appearance was in the year 1845, when it was first seen in the Isle of Wight and a few weeks after was observed with great wonder and dismay by all growers of the potato throughout Europe. It is a plant which flourishes only in damp weather, and its prevalence depends much on the condition of the atmosphere. The fungus is first recognized by the potato leaves turning brown, owing to the absorbing threads of the "rot" within the tissue. Soon certain threads come to the surface, pass through the breathing pores, divide into several branches, and bear the conidial spores on the tips. In this condition the leaves look as if covered with a fine frost. The spores thus produced germinate at once, and in this way the disease is rapidly spread to other plants throughout the field. The fungus soon passes down the stem to the growing tubers, and they in turn give up their substance to this parasite, and then become rotten. As the rot does not make its appearance until the hot and moist days of July, the earlier varieties stand a greater chance of escaping it than the later. In all cases where the disease is gradual in its appearance, and the tubers are nearly mature, they should be dug at once. If the fungus has reached the tubers they will rot to some extent; but when placed in a dry cellar the rotting is considerably retarded. In raising potatoes, select a well drained or naturally dry soil; plant early varieties and plant them early. Always plant the soundest and most mature tubers. Gather the crop as early as possible and burn all tops at once, thus destroying the spores which might otherwise carry the pest over the winter season. When every condition is the most favorable for its development the rot will take its most violent form, and the crop will fail as it has so often done in the past.

The potato rot has long been known to the South American Indians dwelling in the regions of the Andes, showing that this plague is not of recent origin, and also that the land which gave us the wild potato has likewise produced its most destructive parasite, which has followed it across the seas. There is no object in nature concerning which men have given more curious and conflicting theories than the plant in question, and to-day the list is long of those who fail to recognize in it a member of the vegetable kingdom. But when the plant can be cultivated, the spores sown on sound potatoes, and the vegetable watched through its whole existence, culminating in the rot, it is time to believe that it is as much a plant as the one upon which it grows.

Another species of this same genus, *Peronospora*, is the American Grape-vine Mildew. The true grape disease, the one which has proved so disastrous at different times to the vines of Europe and Madeira, is caused by another fungus, to which Berkeley has given the name of *Oïdium Tuckeri*. It is a form of a fungus which has not been recognized in its perfect state, and is supposed to occur to some extent on this side of the waters; but as many species have this conidial form, and some nearly identical with it, and also growing on the grape, there may be some doubt as to our vines ever being attacked by the true grape disease of Europe. The *Peronospora viticola*, the mildew which most interests the grape growers of America, is quite common, appearing on the under surface of the leaves about the first of August, and continuing to flourish until the leaves will nourish it no longer. It can be most easily seen on the smooth leaves of the *Vitis cordifolia*, having the appearance of small, frost-like spots, which rapidly spread and soon cover the whole leaf, frequently extending down the petiole to the stem. This fungus, like the potato rot and other closely-related species, flourishes best in moist, warm weather. Under the microscope, the tissue of the grape leaf is seen to contain an abundance of minute threads, which force their way in all directions between the cells of the leaf, thrusting their suckers into the cells to rob them of their nourishment. When the time for fruiting comes, the threads pass out of the stomata of the leaf and branch in a definite manner, and bear the asexual spores on their tips, as we have observed in the potato rot. Under the head of the germination of these asexual bodies, Dr. Farlow has performed some interesting experiments. He finds they germinate equally well in the dark as in the light. Those

sown in the morning germinate more quickly and abundantly than those sown in the afternoon. It was not possible to keep the spores which were formed in the night until the afternoon, as they generally fell from their attachments in the morning and began to germinate. In all cases the germination took place with surprising regularity. At the expiration of an hour and a quarter the contents of the spores had formed small oval bodies, which, before long, ruptured the cell wall and made their escape from the mother cell. They passed out rather slowly, usually one at a time, and paused for a moment in front of the opening, where they remained as if not quite free one from another. In a short time, each body began to extricate itself from the common mass, moved more and more actively, and finally darted off with great rapidity—a full-fledged zoöspore, furnished with two cilia. The average number of these rapidly-moving spores is from six to eight. Their movement gradually grows slower, and in from fifteen to twenty minutes they come to rest. Soon an outgrowth proceeds from one side and rapidly develops into a new plant. The sexual spores are found in autumn, within the tissue of the shrivelled leaves, as spherical, thick-walled bodies. They escape by the breaking up of the dry leaf, or through the decay of the surrounding tissue. The statement is often made that the mildew does not grow on the *Vitis vinifera*. By carefully conducted experiments, Dr. Farlow found it could be made to grow on the leaves of this European species, and with the usual luxuriance.

The Black Knot, to quote from Dr. Farlow's excellent article on this subject, published in the "Bulletin of the Bussey Institution," Vol. I, p. 440, is "without doubt the most striking disease of vegetable origin occurring on fruit trees in this country. The disease takes its name from the unsightly, black, wart-like excrescences, with which every one is familiar on plum trees and different kinds of wild and cultivated cherries. It is found in all parts of our country, east of the Rocky mountains, and is so common and destructive that in some districts one seldom sees a plum tree free from the knot. In some parts of New England, particularly in Maine and along the sea-coast, the raising of cherries has also been almost abandoned in consequence of the ravages of the black knot. The disease is peculiar to America, and has been the bane of fruit-growers from early times; and although much has been written in agricultural papers about its injury to the fruit crop the subject has been almost

entirely neglected by botanists. As a preliminary step it will be well to trace the development of the knot as it occurs on a single species, and for this purpose the choke cherry (*Prunus Virginiana*) may be selected." The size of the knots varies greatly, being found on the species of *Prunus* under consideration all the way from a few lines to several inches in length, with an average of two inches in circumference. The knot does not usually entirely surround the branch, but, growing from one side, often causes the stem to bend or twist into an irregular shape. In the winter, when the branches are leafless, the knots are much more noticeable, and at this season they are often cracked, broken, worm-eaten and hollow.

In the swollen portions of the branch, above and below the knot, sections under the microscope show the vegetative portion of the fungus in the form of minute threads, twisted together and extending from the cambium towards the outer portion of the stem, where they become separated. The fungus first reaches the cambium, either by germination of spores on the surface of the branch, or by mycelium proceeding from a neighboring knot. The part of the cambium free from these bundles of mycelial threads, grows in the usual manner; and in an old branch shows one more layer of wood on the sound side than on the diseased side. From this it is to be concluded that the growing layer of tissue of the plum or cherry branch, is the place in which the fungus begins its destructive work. In the spring the swollen portion of the branch increases in size, and the mycelium soon reaches and bursts through the bark, so that by the time the choke cherry is in flower the knob has reached nearly its full size, though differing from an old one in being still greenish in color and solid or pulpy in consistency.

With a hand lens one can see small hemispherical protuberances which are the beginnings of the "perithicea," or pits in which the sexual spores are to form. The whole surface of the protuberances is covered with filaments, which are somewhat flexuous and branched. At the terminal joints, or frequently a little to one side, conidial spores are borne. These spores continue to be formed until near the close of summer, when the filaments dry up and only their shrivelled remains are to be seen. The knots now assume their black color, the inner pulp being either destroyed by insects or reduced to a powdery mass, with only the hard outer shell which contains the perithicea left in place. About the middle of January the spores in the sacs in the perithicea begin to ripen.

The knots on the choke cherry when compared with those on the plum and cultivated varieties of cherry are seen to be slightly different in general appearance, but when viewed with the microscope all prove to be identical, the difference noticeable to the naked eye being due to more favorable circumstances for its growth afforded by one species of *Prunus* than another.

Dr. Schweinitz was the first to describe the fungus causing the black knot, under the name of *Sphœria morbosa*.

The black knot is far from being of recent origin, and has furnished a subject about which vastly more has been written than was known. Many, especially the early writers, held it to be of insect origin, while, later, others have looked upon it as a vegetable growth, and still others include in its production both these forms of life. During the last thirty years the insect theory has been gradually given up by the entomologists, but it still remains for many fruit growers to accept the knot as being of fungous origin. The proof given by Dr. Farlow is very conclusive on this long disputed point. "First, the knots do not resemble the galls made by any known insect. Secondly, although insects or remains of insects, are generally found in old knots, in most cases no insects at all are found in them when young. Thirdly, the insects that have been found by entomologists in the knots are not all of one species, but of several different species which are also found on trees that are never affected by the knot. On the other hand, we never have the black knot without the *Sphœria morbosa*, as was admitted by Harris, and the mycelium of that fungus is found in the slightly swollen stem long before anything which could be called a knot has made its appearance. Furthermore, the *Sphœria morbosa* is not known to occur anywhere except in connection with the knots."

With a knowledge of the nature of this contagious disease, the remedy at once suggests itself, namely, to cut off the knots, together with the swollen portions of the branches, whenever and wherever they are found. In autumn, as soon as the leaves fall, the knots can be most easily seen, and all branches bearing them should be cut off and burned at once. Though the sexual spores do not form until late in winter, it was carefully observed that were the knots left undestroyed they would ripen after the branch was cut from the tree. The choke cherry, bird cherry, and wild plum furnish means for rapid propagation of the knot, and they should be gladly sacrificed for the good of their more worthy allies. Knowing the cause,

nature, and means of propagation of the black knot, it is for the fruit growers to profit by their instruction and use their best endeavors to destroy this pest. It is now peculiar to America, and any means of introducing it into other countries should be carefully avoided.

In concluding this general and very incomplete account of fungi, perhaps it will not be more than justice to give a notice of some of these parasitic plants which prey upon living animals.

Who has not seen house-flies in autumn, crawling slowly upon the wall with their bodies covered with a white powder, making them appear as if they had paid a visit to the flour barrel; or, later still, found them fastened in death to the wall or window-pane? The struggle between the animal and vegetable has been won by the latter, which in turn must also perish when the substance of the fly is all destroyed. The tender and valuable silk-worm has long been subject to epidemics, by which large quantities have perished, causing such fluctuations in the price of silk that the trade in this product has frequently been threatened with a panic. The fungus, which is commonly called *muscardine*, begins its growth within the body of the insect, soon to increase in size and burst through the skin, thus producing death.

One of the most curious of these insect infesting or carnivorous fungi grows upon or from the head of the larva of a certain species of moth. It is an amusing sight to see the heavily burdened larva bearing erect upon the front of its body a vegetable growth, often three or four times its own length, the signal of distress as it must be, telling plainly the slow but inevitable approach of death.

Thus we have seen that the members of this peculiar group of plants which has received the name of fungi, are all parasites, and from their very nature do not increase the amount of organic matter in the world, but on the other hand, are powerful reducing agents, seizing upon that which is highly organized, and aiding rapidly in its reduction to a more simple state.

Though fungi furnish delicious articles of food, it is in the light of their power to hasten decomposition that we see their great importance in the world; aiding in the cycle of life by facilitating decay. Sometimes they encroach upon our fields of growing grains and fruits and do us serious damage; but even here the moralist would say there is a lesson of appreciation and care for our crops, which only the school of sad experience is able to teach.

The lecture was illustrated by large diagrams of the different parts of several fungi, and also by specimens preserved in alcohol and others mounted on cards. Some of the diagrams are reproduced here.

Explanation of the Plates.

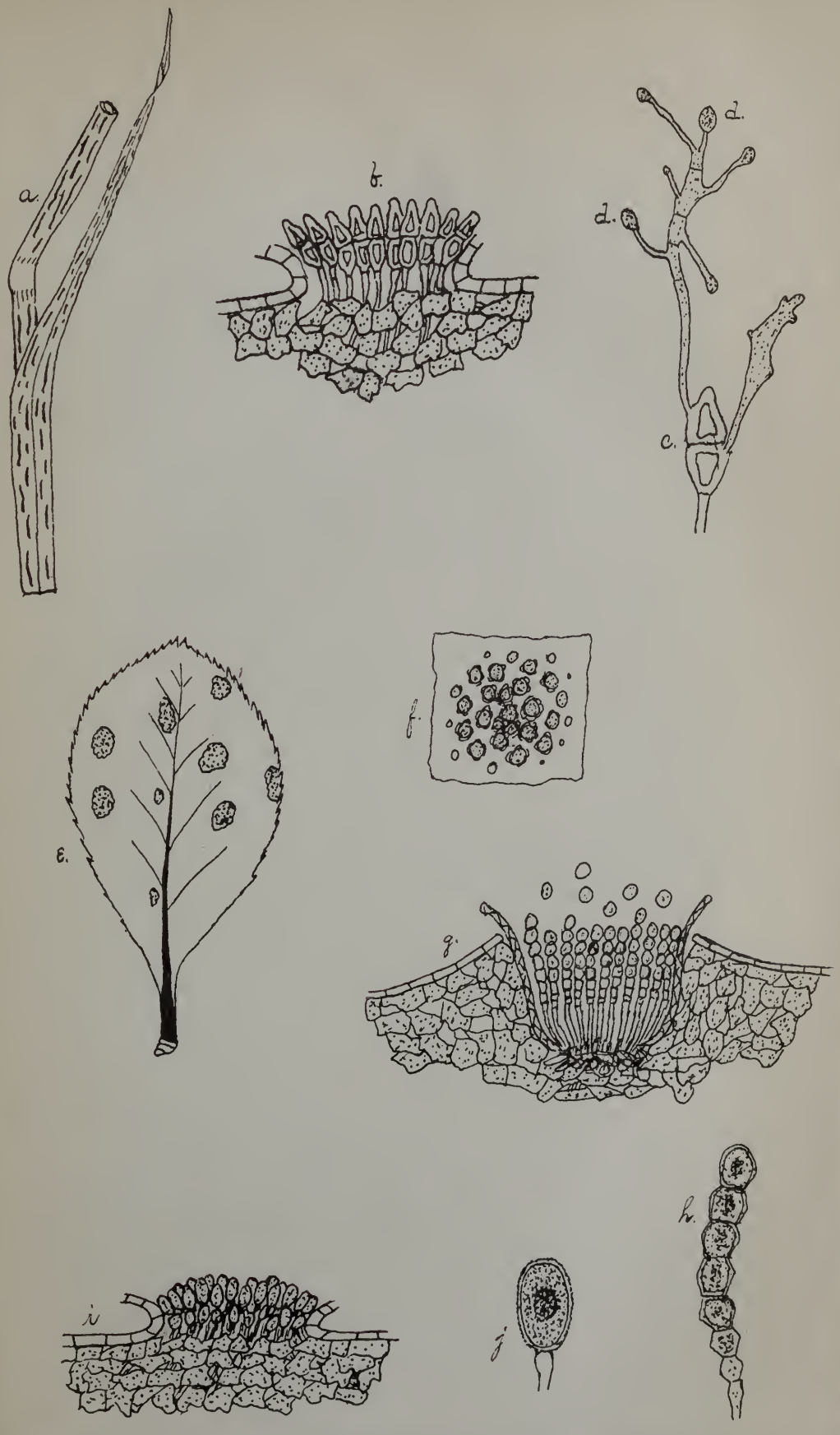
Plate I. Wheat Rust (*Puccinia Graminis* Pers). Figure *a* represents the teleutospores, or perfect state of the rust, as seen on the stems and leaves of grains and other grasses, at the close of the season and early in spring; *b* a cross-section of the outer portion of the stem, highly magnified, showing the ripe teleutospores after they have burst the epidermis; *c*, teleutospores germinating and producing the sporidia *d d; e*, barberry leaf, showing the underside with its "cluster-cups" (*œcidium* form); *f*, one of these cluster of cups somewhat enlarged; *g*, a mature cup in cross-section; *h*, one of the rows of spores as formed in the cup, highly magnified; *i*, a magnified cross-section of grass leaf, with the *uredo* state of the fungus after the spores have burst through the epidermis; *j*, one of the uredo spores more highly magnified.

Plate II. Grape Mildew (*Peronospora viticola*, B. and C.) *a* represents a leaf of *Vitis cordifolia* affected by the mildew; *b*, a cross-section of a grape leaf, much magnified, showing the filaments of the fungus in the tissue, from which they finally pass out through the stomata and form the *asexual* spore bearing the branched top *c; d* is a highly magnified view of the filaments in the leaf, with their *haustoria* or "suckers," *e e*, penetrating through the neighboring cell-walls; *f*, one of the sporangia from *c*, highly magnified, and dividing up into zoöspores; *g*, a zoöspore; *h*, a large *sexual* spore, separated from the grape tissue in which it is formed.

Plate III. Black Knot (*Sphœria morbosa* Schw). *a* represents a mature black knot; *b*, a cross-section of the same, and the stem which bears it; *c*, enlarged view of first form of asexual spores, borne on filaments over the surface of the knot; *d*, *stylospores*—a second form of asexual spores formed in pits of the knot; *e*, a perithecium in cross-section, showing the sexual spores borne in sacs; *f*, two of these sacs with their spores, highly magnified, and a number of *paraphyses*, or sterile threads, around them.

Figures *d*, *f*, *g*, and *h* of plate II, and *b*, *c*, *d*, *e*, and *f* of plate III, are drawn from figures by Dr. Farlow, in Vol. I, Part V, of the "Bulletin of the Bussey Institution."

PLATE I



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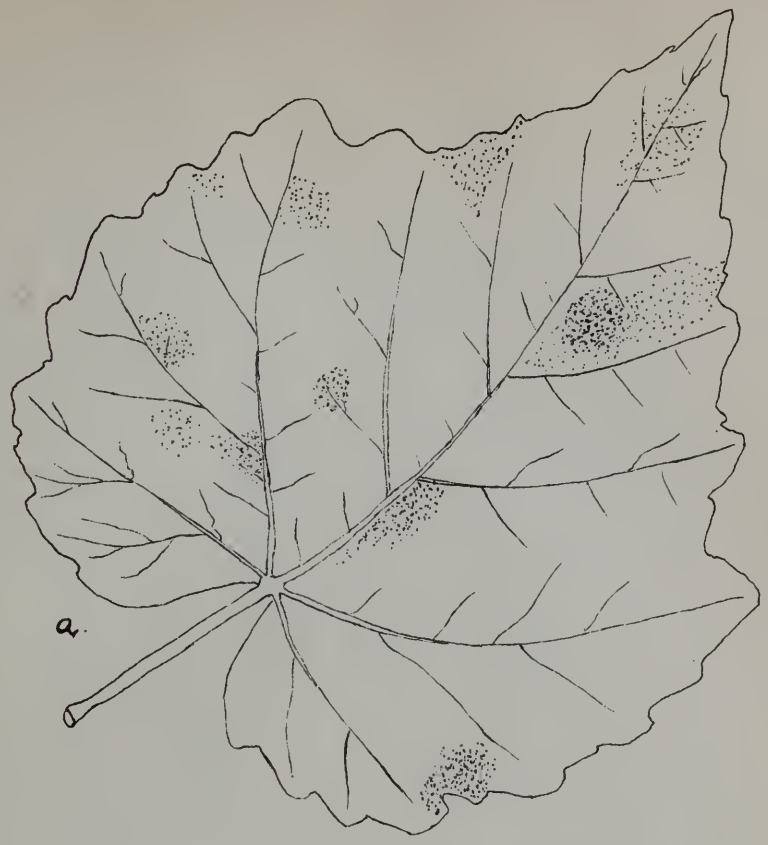
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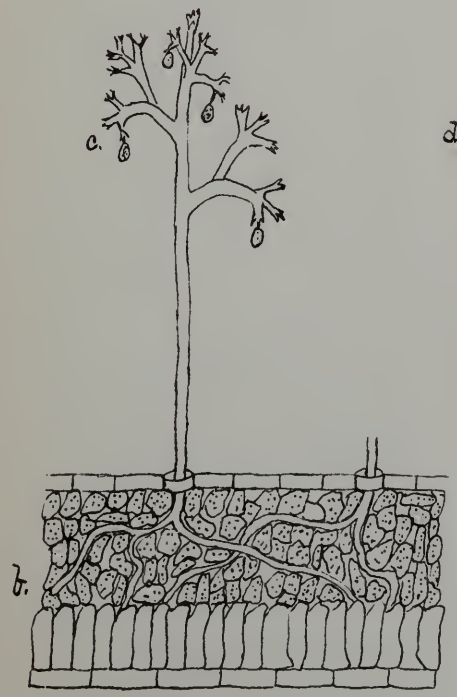
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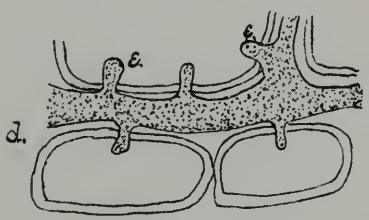
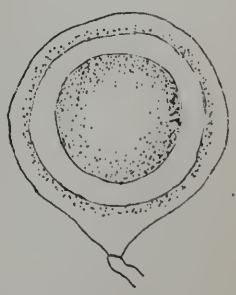
c.

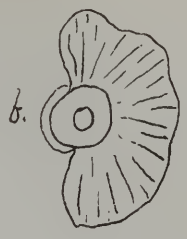

d.
e.

f.

g.


h.

a.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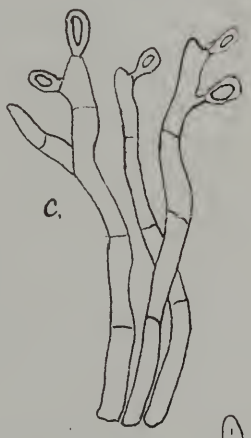
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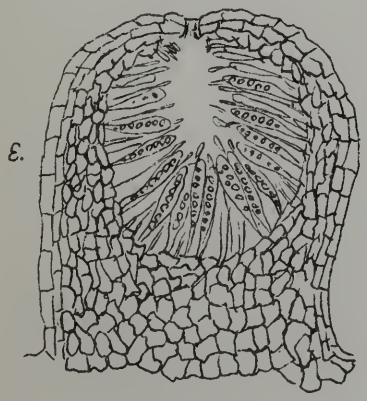
d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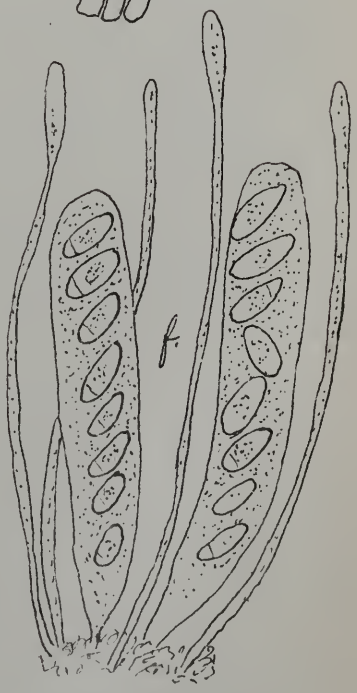
f.

Discussion.

Marshall P. Wilder thought Mr. Halsted's remarks on the plum wart the soundest and most practical he had ever heard in so few words. He alluded to a paper on injurious insects, by Dr. T. W. Harris, published in the "Proceedings of the American Pomological Society," for 1854, in which Dr. Harris recognized the presence in the plum wart of the *Sphœria*, and also of insects, but did not consider either of them the cause of the warts.

In answer to an inquiry, Mr. Halsted said that the potato rot was largely propagated by immature and affected tubers, with the mycelium running through every part, but its presence is unknown when the tubers are planted, and until it is too late to apply a remedy. He was doubtful whether the solution of lime, which has proved effectual in preventing mildew on grape vines, would prevent the potato rot, though there could be no harm in making the trial. The change in the color of the leaf is a manifestation of fungus all through the plant, and the whole thing goes in a day.

Augustus T. Perkins suggested soaking the seed after cutting, in a solution of sulphur.

Mr. Halsted said that the fungi are the toughest of all plants, and any solution strong enough to destroy them would destroy the plants on which they grow.

The Chairman remarked that farmers had sometimes saved their crops of potatoes by mowing the tops.

Mr. Halsted said that the foliage contains the fruiting part of the fungus and that consequently mowing would prevent the spread of the disease.

The thanks of the meeting were voted to Mr. Halsted for his interesting and instructive lecture. The Chairman announced that at some future time the subject of the lecture would be further discussed.

BUSINESS MEETING.

Saturday, February 3, 1877.

An adjourned meeting of the Society was holden at 11 o'clock, President Parkman in the chair.

William J. Vass, of Dorchester, having been recommended by the Executive Committee, was duly elected a member of the Society.

William C. Strong, Chairman of the Committee on Publication and Discussion, presented the following vote which was unanimously passed.

Voted, That the thanks of the Society be presented to Professor Goodale for his very instructive and suggestive lecture upon Fertilization and Cross-Fertilization, so generously delivered by him before the Society on Saturday, January 20.

The following letter from G. F. B. Leighton, President of the Norfolk Horticultural and Pomological Society, and a Corresponding Member of this Society, was read by the Secretary.

NORFOLK, VA., Dec. 6th, 1876.

To the Officers and Members of the
Massachusetts Horticultural Society:

GENTLEMEN: — In response to the compliment of electing me a Corresponding Member of your society, I most cheerfully note what has passed under my observation during the past season.

Windbreaks. I have one thousand Bartletts on the north side of a thorough windbreak, reaching to the height of sixty to seventy feet, and have on the south side of said break about seven hundred of the same variety. The darkies pronounce the south side a jacket warmer in the winter than the north side, and yet there was no perceptible difference in the time of blooming last spring, while in the maturing of the fruit there was the difference of one week in favor of the south side; the greatest value, however, is in the prevention of premature dropping of fruit from gales, etc.

Blight. Under the head of this insidious disease, I notice after a warm spell in the spring, followed by cold nights and warm days, that it makes its appearance, and the greater the difference of temperature between the night and day, the more violent the attack. When the difference was over thirty-five degrees, close watching became necessary.

From reports of several parties, I am quite inclined to the opinion that the application of boiled linseed oil may in many, if not in all, cases of blight, arrest the disease. I shall try the experiment if blight is apparent next season, and as sulphur is so obnoxious to the insect family I shall add that to the oil, on a portion.

I predict a good run in the south for Clapp's Favorite. It proves very healthy — fruit not as large as in its native state, — but of

handsomer shape, and ten days ahead of the Bartlett. It is tardy in coming into bearing as a standard, but as a dwarf bears as early as any other variety. I probably have two hundred dwarfs of this variety, and as yet have not lost one from any cause. Their plantings range from three to eight years. They require heading back for four or five years to form a compact head, which is more desirable with us than with you. My standards are often taken for apple trees, for they really look to the unpractised eye more like apples than pears. As I gather the fruit ten days before maturity I have never seen one rotten at the core.

The past season has furnished an increased supply of injurious insects. Crickets have quadrupled their numbers and attack a pear as soon as it touches ground. The brown or house wasp has greatly increased and stings the growing pears, causing hard lumps and imperfections. Grasshoppers have increased and have done considerable damage to the kale crop the past fall. The potato bug has not yet put in an appearance.

Spring frosts have prevented me from placing fruits upon your tables the past three years, but I hope another spring will inaugurate a change. I fear the denuding of our forests has an influence in producing these results, the axe of the slayer being in constant motion.

Thanking you, and your most efficient Treasurer, Mr. Buswell, for copies of your valuable TRANSACTIONS to myself and the Norfolk Horticultural and Pomological Society,

I remain, with highest esteem,

Your obedient servant,

G. F. B. LEIGHTON.

Adjourned to the first Saturday in March.

MEETING FOR DISCUSSION.

This meeting was organized for the purpose of listening to the Essay on the Improvement and Ornamentation of Suburban and Country Roads, by Dr. Slade, for which a prize was awarded by the Committee. The essayist not having arrived at the close of the business meeting, the subject of pear tree blight, mentioned in Mr. Leighton's letter, was taken up.

C. M. Hovey said that the subject had been frequently discussed without discovering its cause. The disease had made its appearance this year in Arlington and neighboring towns, and had nearly destroyed whole orchards; and, if it continued, would much lessen the value of the pear as a market fruit, and we should be obliged to substitute the apple.

W. C. Strong thought the lecture of Mr. Halsted suggestive in regard to the blight. The plum wart is now known to be caused by a fungus, and the prevailing impression as to the cause of blight in the pear tree is different from that formerly entertained; it is also believed to be caused by fungus. The theory that it is caused by frozen sap is giving way to the fungus theory.

Hervey Davis thought that good cultivation would prevent blight. In his observation it had been most prevalent in low, wet, clayey ground. In George Hill's grounds, at Arlington, apple trees, especially the Porters, had been injured by blight similar to that of the pear—some of them quite seriously. Mr. Davis had never heard of blight affecting the apple in any other instance.

John B. Moore said that some of the best cultivators had suffered most. Among those at Arlington who had suffered severely, were Mr. Crosby, whose land was low, and Mr. Fillebrown and others, whose soil was sandy.

Josiah Crosby wished it was true that either wet or dry soil would prevent blight.

Mr. Hovey said that western cultivators find orchards in grass less subject to blight than when the land is tilled. The best preventive is to grow trees without manure. The frozen sap theory is now exploded. Trees just imported from France have been found affected. Mr. Locke, of Belmont, had suffered more than any other cultivator in this vicinity. Mr. Barry, of Rochester, was surprised that limbs affected with blight were not cut off, but Mr. Locke, who began cutting off the limbs immediately on the appearance of blight, soon found that he must cut at the bottom of the tree. Cultivators should be observant of the conditions under which blight attacks their trees. Last summer was unusually hot—the days especially. The speaker believed the blight to be caused by a miasma arising from the ground, and the sun shining through these exhalations caused the tree to become scorched, but we are no nearer to a certain solution of the matter than we were twenty-five years ago.

Mr. Strong hoped that none would draw the inference from the remarks made, that the pear was doomed. He believed the injury experienced last year to be exceptional, and that in future we should be free from it.

Dr. Slade, having arrived, was introduced by the President and read the following Essay:

The Improvement and Ornamentation of Suburban and Country Roads.

BY DANIEL DENISON SLADE.

It may be readily conceded that nothing concerns a people more essentially than the sure and easy means of communication between the different sections of their country, and nothing more certainly marks their progress in civilization, than the condition of their highways. In an inaugural address, a former chief magistrate* of this state, says:

"Those of our citizens who have visited Europe are unanimous in the opinion that our public roads are far inferior to those of other countries, where the means of easy and safe communication are better appreciated. The science of road-making is apparently not well understood; or if it is, the present modes of superintending the construction and repair of roads are so defective, that the public suffer to an extent of which few of us are aware. It may be found, upon investigating the cause of our miserably poor and ill-constructed roads, that the laws relating to this subject need revision, so as to give more uniformity in the construction and the repair of our highways."

In an essay of this character, however, it cannot be expected that we should advance the laws which govern the operations of the civil engineer, nor are we called upon to produce an elaborate treatise upon road-building. Such treatises, for which prizes offered by our legislature have been awarded to successful competitors, have already been written within the last few years. Moreover, excellent standard works on the subject exist in almost every language, and may be easily obtained and consulted.

It is left for us, therefore, to state in general terms, what are the

* Gov. Claflin, 1869.

characteristics of good roads, how they are to be constructed or improved and properly maintained, wherein lie our deficiencies and in what way these may be remedied—and finally, to what extent and in what manner the æsthetic principles are to govern.

The characteristics of a properly constructed and well laid-out road consist in a road-bed presenting a uniform, smooth, and level surface, with a slight convexity at the centre, of a firmness sufficient to sustain the weight of heavy loads without yielding, of a longitudinal grade not exceeding the minimum possible under the circumstances, of a width commensurate with the amount of travel and the proximity to a populous centre, and of a course as direct as practicable from one given point to another.

In order to secure the first desiderata, viz., the requisite firmness and smoothness, there must be the most thorough drainage, no matter of what material the road-bed is constructed. Through neglect of this most essential point, the result of a false economy, the building of a road often proves an entire failure. In all cases, both surface and under-drainage *must* be provided, necessitating of course the construction of proper culverts, embankments, and ditches; the first providing against damage from the rainfall, and the latter against excess of water in the road-bed or in the soil beneath.

Modern experience has taught that the best roads are those constructed according to the plans of Mr. Telford, in England, and which consist of two component parts — a foundation, and a superstructure. The foundation is made up of broken stones of the dimension of about twelve inches, laid lengthways across the road, and their interstices filled with broken fragments, with a slight lateral inclination from the centre.

The superstructure consists of an even layer of stones broken into angular fragments of not more than two and one-half inches in diameter, and forming a depth of between three and four inches. Over this is to be spread a coating of fine gravel, which having been well moistened, is to be rolled until it presents a perfectly smooth and level surface. Whatever may be the materials used for the superstructure, the foundation, such as we have described, is indispensable.

As regards the proper longitudinal grade of a road-bed, it is impossible to give any fixed rules that are applicable under all circumstances.

"We can better afford to increase the length of a road consider-

ably than to retain grades, in places, so heavy that a team is unable to haul more than half, or perhaps one-quarter, the load it can on all the remainder of it. Roads which are steep in the line of their axis are not only more severe on teams, but they are dangerous, and much more expensive to keep in repair."*

"The useful deduction from experiments and from practical experience is, that for a well-made road, with a hard and compact surface, the inclination ought not to exceed one in thirty, and for ordinary gravel roads one in twenty.†

"In treating of roads it often renders the subject much clearer to divide them into three classes: first, second, and third class roads, or, as we might also say, state, county, and town roads. Accepting this nomenclature, we have this: for first-class or state roads, the greatest inclination should not exceed from three to five in a hundred; second class or county roads, from five to seven in a hundred; third class or town roads, from seven to ten in a hundred. A road rising ten in a hundred is not supposed ever to have any heavy teams upon it. In ascending a hill it is well and proper to decrease the grade as the top is reached, and in the same measure as the horses get tired."‡

The transverse grade of the road-bed, or its cross-section, should form an arc of a circle of about ninety feet radius. In other words it should be just sufficient to allow the rain-fall to run off at the sides. If the inclination at the sides is greater, the travel will constantly seek the centre, to the gradual injury of the superstructure of the road-bed.

The laying out of a road, both as to its direction and necessary width, requires the best engineering skill. As a general rule, the first should be as direct as possible from one given point to another, the chief object in view being to carry the most in a given space, at the least expense of either time or money. This rule is especially applicable to all suburban roads and to those which may be classified as state or county roads.

Under the term width, should be included that between the fences or boundaries, and the width of the road-bed itself. Too great a width of the latter is not desirable, as the cost of maintaining it is much increased; and it is far better to have a good road-bed of suf-

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*Report of the U. S. Commissioner of Agriculture for 1868, p. 358.

†Third Prize Essay, Mass. Agricultural Report, 1869–70, p. 289.

‡First Prize Essay, Mass. Agricultural Report, 1869–70, p. 209.

ficient width than a poor one of too great width. "The width of first, second, and third class roadways, may be given as twenty-six, eighteen and a half, and thirteen feet, with a tendency during the last ten years to have none, except in the vicinity of cities, wider than twenty-four feet, and the rest correspondingly narrower. In view of the changes constantly going on in this country in the value and settlement of land, it would probably be well always to *lay out* a road fifty or sixty feet wide, but to *build* the road proper of the widths above indicated."*

Under the subject of road-building must necessarily be included the construction of bridges. In all cases these should be built in the most substantial manner, and the materials used should be those which have proved to be the most durable. Even in rural districts, where both stone and wood are abundant, it would often be preferable to build a bridge of the former material. The first cost would be larger, but its greater durability and exemption from repairs would render it in the end much the most economical.

Care should be taken to prevent any obstruction of the stream, by the improper position of bridges. By neglect of this precaution serious damages may be inflicted upon the neighboring lands in a low country, and in high lands the bridges themselves are liable to be swept away. Under these latter circumstances, and in other cases, the iron suspension bridge has proved the most suitable.

Not only durability, but fitness and beauty of design should be leading principles in building a bridge. It is just as economical to construct one that shall give pleasure by its elegance and symmetry as to construct one that is uncouth and out of proportion.

A roadway having been thoroughly constructed from the first, or having been improved in the best manner possible, it is necessary that it should be kept in continuous repair. And it is here that mistakes are so frequently committed. Liberal sums are expended by cities and towns in making perfect roads, and instead of keeping them up to the standard by the necessary repairs at the moment when needed, they are allowed to continue in a defective state, until large outlays are again necessitated, and the travelling public are put to much inconvenience by the unavoidable delay attendant upon operations requiring so much labor.

It is perfectly useless then to expect good roads at any time unless a complete surveillance is made continually, and any defects at

*First Prize Essay, Mass. Agricultural Report, 1869–70, p. 211.

once remedied. "The problem can be put in this way: To have a good road, it is necessary that there be no dust or mud on the same, and that there be no ruts; therefore remove the dust and mud as fast as they are formed, and fill up the ruts as fast as they are made. It may be thought, at the first view, that this is too expensive a system. Its principal beauty, however, lies in the fact that it costs less per mile of road kept one year than the pernicious system of annual or semi-annual repairs, as will be shown and proved. The above two rules — sweep off the mud and dust, as fast as they are formed, and fill up the ruts and bad places with new material as fast as they appear — are all that is necessary to be carried out in order that there be *continually* a good road. Without continual repairs, there can be no such thing as a constantly good road — a proposition that cannot too often be repeated. By repairing a road annually, or twice a year, it matters not which, the result is, strictly speaking, a *good* road at NO time during the whole year. The road is wretched just after repairs; it becomes *passable* after a while, and deteriorates from that day forward, until it is again made wretched. By the other method, is offered us a road as smooth as a floor, year in, year out; and, let it not be forgotten, at *a less expense.*"*

The following plan is that which experience has taught us as the best adapted for the continuous repair system of broken stone roads: The material for the superstructure of the road-bed, ready prepared, is placed at suitable distances along the side of the road. A requisite number of persons are employed to perform the necessary labor. This labor consists in the removal of the dust formed during the dry season, and of the mud during the wet weather; in the removal of the covering as fast as it wears away, and in the filling up of ruts and depressions with new material, at the earliest moment. By a constant oversight and attention to these points, any large ruts are prevented, and by a proper and judicious method of applying the material, the road-bed is preserved in its original integrity.†

Experiments conducted for the purpose, by German and French engineers, conclusively show that resistance to draught is four times as great with deep ruts and thick mud on foundation roads; and that a dusty or muddy condition of otherwise good roads, adds

*First Prize Essay, Massachusetts Agricultural Report, 1869-70, p. 233. †Ibid, pp. 236-238.

very materially to the draught. In order to lessen the wear of the road during the dry season, the surface must be sprinkled; an operation which confers a blessing upon both man and beast at the same time.*

"Bowles, in his book, 'Our New West,' mentions the case of the stage road from Sacramento to Virginia City, *via* Placerville, one hundred and fifty miles long, and having an annual traffic of seven or eight thousand heavy teams, and whose proprietors found that the simplest and cheapest way of keeping it in repair during dry weather was to sprinkle the whole of it—one hundred and fifty miles of mountain road."†

We have now given what may be considered as the standard in road building, and we have stated how that standard can best be maintained. It would seem superfluous for us to say, that as a people, we fall very far below that standard. No one who has the least occasion to travel on our ill-constructed roads can fail to be aware of their imperfect condition during a greater portion of the year, a condition which could only be excused in the most thinly inhabited mountainous or sandy districts. Strange as it may appear, even our immediate community is not yet educated up to a full knowledge of the value of good highways, although a gradual advance in the right direction is perceptible.

Large sums of money are annually expended upon our roads, which may be said to be actually lost for want of proper and constant superintendence. Not only are many of them improperly built at the outset, but when repairs are made these are performed in such an imperfect manner, with such poor material, and often in the dry season, that travel over them is rendered more difficult than ever, while the first heavy rainfall is too apt to wash away all traces of the attempts at renovation.

One of the causes of our deficiencies in these matters may doubtless be attributed to a system long pursued in this state, which, however well it may have been adapted to the colonial period, is no longer applicable at the present day. We refer to a law of this commonwealth, which requires towns to raise annually a certain amount of money to be appropriated to the making and repairing of roads, to divide the town into districts, and to appoint a surveyor over each district, who shall see that the money is

*See First Prize Essay, Massachusetts Agricultural Report, 1869–70, pp. 242, 243.
†Ibid, p. 237.

properly expended. To every inhabitant is offered the privilege of working out his proportion of taxes at a price stipulated by the town. There would be no serious objection to this system, if all were alike interested in having good roads, but as circumstances are, it is too apt to result in a holiday's amusement, under the supervision of a man who has been chosen rather for his popularity, than for any knowledge that he may have of building roads.

"The time the surveyor chooses is generally when he has the most leisure, and whether required or not, he frequently works out his money at once, and gets done with it. The work is often performed in the rudest manner, and the road is coated here and there with thick patches of worthless stuff—better suited for top-dressing for crops than for road material—to be washed into the gutters on the occurrence of the first heavy rain. From want of judgment, or want of interest, the money is wasted, and the people are burdened with the heavier tax of struggling over hard roads, made worse by the money they have paid for improving them. Less frequently a man is chosen who understands better what is needful to be done, and with what means he has, he commences some improvements, which, if followed up in after years, would result in a public benefit; but his office is only for a year, and he may be followed by a man who will undo what was well begun."*

An improvement on this system has been adopted by many of our cities and larger towns, and consists in the appointment of a superintendent, with an efficient corps of workmen under him, who has authority to make the purchase of all necessary machinery and paraphernalia, and who has complete supervision of roads and bridges. Even in the smaller towns much might be effected under a modification of the present system. Thus, let laborers be employed, under the supervision of one overseer, appointed by the town, who, in the various districts, shall keep the roads of that district in *constant* repair, filling up all ruts and holes as soon as formed; using only the best materials to be obtained, and these in a thorough and workmanlike manner. Let all new roads be constructed with especial reference to complete under-drainage, and let all culverts, drains, and ditches be kept open; let the surface of every road be kept smooth and free from loose stones, and in dry weather, wherever practicable, well sprinkled. Such a plan, of course, necessitates constant labor, but it will be found to be the

*Third Prize Essay, Massachusetts Agricultural Report, 1869–70, p. 304.

most economical, and by far the most satisfactory to every traveller, as well as tax-payer, in the community.

But we cannot hope for a general and radical improvement in the condition of our highways, until the laws respecting the same are amended. There must be a uniform system of management throughout the commonwealth, and this might be effected by the adoption of a plan similar to the following, of which we give a mere outline:

First, there should be created a state department of roads and bridges, at the head of which should be a practical civil engineer, thoroughly educated, and entirely conversant with that construction and management of roads which experience has taught older nations to be in every way the best. Next, the state should be divided into districts, to each of which should be appointed a supervisor, who should be responsible to the chief for the proper management of affairs within his limits. The roads throughout the state would thus receive uniform attention, and every town would gain the benefit to be derived from the most improved and costly machinery, which is now limited to a few of the largest that can afford to purchase it, while the best material could be used wherever found, without regard to boundaries of towns.

Wood, iron, stone, and asphalt, are materials which are also used for road surfaces, but as they are better adapted to the paving of city streets, we shall have no occasion to discuss their relative value in these pages.

Modern improvement demands that all suburban roads, and those of thickly populated districts in the country, should be provided with sidewalks or foot-paths, and that they should be well lighted. The sidewalks, in all cases, should be constructed with reference to proper drainage, and the materials used should be those which are found to be the most suitable and easily obtained in the immediate neighborhood. In suburban districts bricks or stone flagging may be found the most durable, and therefore the most economical. Asphalt has seemed, thus far, to answer a good purpose, and possesses some advantages. But the sidewalk or foot-path, which is most applicable to our country roads, is constructed of small stones as a foundation, with gravel as surface, and rolled hard and very smooth. Of whatever material they are made, they should be considered as a necessary adjunct to the road-bed, and kept in continuous repair.

Either gas or oils of various kinds, are the articles best adapted to lighting roads; and they should be provided for this purpose in every suburban district, and in every populous village. In fact, well lighted roads are absolutely essential to every community, not only as means of comfort and convenience, but also as a protection against "the evils that walk in darkness."

Public highways of the best possible construction having been provided, it then becomes a cultivated people to ornament them. This is most fitly and usefully accomplished, by the introduction of trees along their borders. If any one doubts the truth of such an assertion, they have only to visit some of the older towns in our commonwealth, more especially in the western portions, and along the valley of the Connecticut, where they cannot fail to admire the magnificent elms and sugar maples that adorn the road-sides, which the foresight of a former generation has provided for our gratification, and the presence of which gives a certain character to those towns, which nothing else can supply.

A proper selection of trees most suitable for the purpose must be made, and as a general rule, those should be chosen which are indigenous to the particular district. Experience has shown that the American elm and the sugar maple are more universally adapted to road-side planting than any others. To these we may add other species of maple, certain kinds of oak, the ash, hickory, and English elm. Care must be taken that the trees are not planted too thickly, or in such a way as to overshadow the road to the entire exclusion of sun and light, for although such a condition may be agreeable to the passing traveller and his beasts, it is apt to create a degree of moisture which is not conducive to the preservation of the road-bed surface.

Evergreens are in no way suitable for road-side planting, and should never be allowed to occupy a position by which the sun is excluded, and whereby ice and snow are retained in the spring months, long after their disappearance in other places, rendering the travel difficult and dangerous.

There are many roads, which may be truly called "country roads" in contradistinction to the suburban, and the great thoroughfares of the larger towns, which need no ornamentation beyond that which Nature herself has amply provided in the trees and hedges which have sprung up spontaneously along their borders. The very seclusion afforded by this natural embellishment, consti-

tutes their great charm and source of attraction, and should not unnecessarily be interfered with. If the money which is now annually spent by many towns, in assiduously destroying all these charms of our by-ways, by cutting down and uprooting the various shrubs, vines, bushes, and young trees, which serve as breeding places, and afford food to our insectivorous birds, as well as hide the unsightly piles of stones, rubbish, and dilapidated walls — were expended upon the improvement of the road-beds, it would add greatly to the comfort and safety of the traveller. When any substantial reason exists for this extermination of all natural beauty, it is desirable to submit; but as it is often done without any definite object in view, and merely because it is a custom, we suggest that the pleasure afforded by its presence more than compensates for any possible impediment or injury to the road itself.

A true observer* of natural objects thus pleasantly discourses on this subject: — "The beauty of these old roads does not consist in their crookedness, though it cannot be denied that this quality prevents their being tiresome, and adds variety to our prospect, by constantly changing our position. Neither does their beauty consist in their narrowness, though it will be admitted that this quality contributes to their pleasantness by bringing their bushy sidewalks nearer together. Their principal charm consists in the character of their road sides, now overgrown with all that blended variety of herbs and shrubbery which we encounter in a wild pasture. We hear a great deal of complaint of these old roads, because they are crooked and narrow, and because our ancestors did not plant them with trees. But trees have grown up spontaneously in many places, sometimes forming knolls and coppices of inimitable beauty; and often an irregular row of trees and shrubs of different species adds a pleasing variety to the scenes. And how much more delightful is a ride or a stroll through one of these old roads, than through the most highly ornamented suburbs of our cities, with their streets of more convenient width. The very neglect to which they have been left, on account of the small amount of travelling over them, has caused numberless beauties to spring up in their borders.

Let us, therefore, carefully preserve these ancient winding roads, with all their primitive eccentricities. Let no modern vandalism, misnamed public economy, deprive the traveller of their pleasant advantages, by stopping up their beautiful curves, and building

* Wilson Flagg, Studies in the Field and Forest, p. 53.

shorter cuts for economizing distance. How much indeed, would be done for us by Nature, if we did not in conformity with certain notions of improvement, constantly check her spontaneous efforts to cover the land with beauty."

In this connection we would remark that it seems hardly consistent for town authorities, by the offer of prizes or by other means, to induce the inhabitants to set out trees for the ornamentation of the highways, and at the same time to allow these officers on their own responsibility to cut down the magnificent growths of centuries, in order to widen a road unnecessarily, or to straighten a line without sufficient cause. We have known this sacriligious act, as it might well be termed, to be committed without the slightest necessity, and where it would seem that the very exertions made by interested individuals to preserve, only excited the spirit to destroy.

The introduction of water into many of our suburban and country towns, as well as the existence of brooks and springs, renders easy the introduction of fountains and drinking troughs along the road borders. These may be of the most simple construction, as befits the more rural districts, or they may be of stone or iron, more or less ornamented, according to their position and surroundings. The provision and maintenance of these should be compulsory as a public necessity, and they should be placed upon much travelled roads at distances of not more than five miles apart, and at correspondingly shorter distances in thickly settled regions.

There is a practical point which should be kept in mind as regards watering troughs, and which, if adopted, may prevent the occurrence of serious accidents. It is that the supply pipe should be inserted into the bottom of the trough, and not rise much above the surface of the water, when the trough is filled; if it does, and the water is blown about, ice is formed during the winter season, rendering the approach to the trough difficult and dangerous. The overflow should also, in all cases, be conducted in a pipe to a proper drain.

Walls, fences, hedges, and other modes of enclosing property abutting upon the highways are still necessary for protection against intrusion, and as means of seclusion, especially in suburban towns. These may be considered as entering very largely into the ornamentation of our roads, especially when constructed or kept with due regard to refined taste and good judgment. Where such a neces-

sary variety of opinion exists on a subject, no special uniform plan could be adopted, nor would this be desirable. In certain localities, and under certain circumstances, the entire absence of all artificial boundaries might contribute to the embellishment of the public ways by the air of refinement and elegance thus produced.

The borders of all roads, especially in the neighborhood of large towns and villages, should be kept with neatness and with some regard to æsthetic principles. There seems to be an almost entire want of attention to these matters in most of our communities. We not unfrequently see large and small estates maintained with great care and even elegance, within their immediate limits, whilst the roadsides which bound them are neglected and allowed to become the receptacle for filth and rubbish. Every proprietor should take an interest in the public welfare, so far certainly as concerns the neatness and general appearance of the highway bordering upon his estate. And this resolves itself into the adoption of very humble measures, being nothing more than a nicely kept greensward, a healthy condition of hedges, trees, and shrubs; the perfect order of fences and walls, and the absence of everything that may offend the sight.

Mr. Mitchell, in his charming book, "My Farm of Edgewood," in speaking of the æsthetics of the farmer's business says: "Here and there we come upon a certain neatness and order in enclosures, buildings, and fields, but ten to one the keeping of the picture is absolutely ruined by the slatternly condition of the highway, to which, though it pass within ten feet of his door, the farmer by a strange inconsequence, pays no manner of heed. He makes it the receptacle of all waste material, and foists upon the public the offal which he will not tolerate within the limits of his enclosure. And the highway purveyors are mostly as brutally unobservant of neatness as the farmer himself; nay, they seem to put an officious pride into the unseemliness and rawness of their work, and it is only by most persistent watchfulness that I have been able to prevent some bullet-headed road-mender from digging into the turf-slopes at my very door."

In our remarks, we have had our own commonwealth more especially in view. If she, in her general superiority, is so lamentably deficient in the condition of her highways, what can be said of the other older states. We will leave those to answer who can do so from their own experience, merely premising that we are not at all

surprised when reports like the following from the southern states are received by the Department of Agriculture in answer to inquiries.*

From Florida. "No road laws, no bridges; streams are crossed by ferries, fording, or swimming."

From Texas. "Our roads are not worked, the wagoner making his own way. Soil remarkably favorable for roads. No macadamizing material in the state, none needed. Road laws in this magnificent state, like other laws, seldom executed. No turnpikes; don't need them. Roads last until they become too miry, when wagoners cut a new one. Texas can boast of the best roads, with the least work, of any state in or out of the Union. Our citizens generally regard work as *unconstitutional*."

Finally, as we have already remarked, if we desire an improvement in the condition of our suburban and country roads, we must have a uniform system, by which to work, throughout the state, and in order to effect this, there must be a revision of the laws upon the subject. Let Massachusetts lead in such a needful reform, and other states, seeing the advantages, will quickly follow her footsteps.

Discussion.

C. M. Hovey expressed himself as much pleased with the essay, and hoped it would lead to better results than we have at present. The roads in England are unsurpassed; they are all macadamized, and are kept in order by sweeping off the dust and scraping up the mud as soon as they collect. As Dr. Slade has said, the superintendents of repairs here are seldom men possessing any special or practical knowledge of the subject. Mr. Hovey alluded to the roads in Cambridge, where the superintendent was formerly a lumber manufacturer.

Mr. Strong said that we think the roads of Massachusetts pretty good, and gentlemen from the West and South think them very good; but he hoped we should do what we could to promote a feeling of dissatisfaction with our roads, for he agreed with Mr. Hovey that they are far inferior to those of foreign countries, and that the superintendents are often utterly unfit for the service. As he drove into town to-day his horse was so frightened by a heap of ashes at the roadside that he was almost prevented from being present at the meeting.

* Report of the U. S. Commissioner of Agriculture, for 1868, p. 348.

Marshall P. Wilder was glad to know that this subject had been introduced. The only way to effect improvement in our roads is to enlighten public sentiment. The subject has been very thoroughly discussed in the meetings of the State Board of Agriculture. Forty-five years ago, when he first went to Dorchester, the roads from his house to the church were at times almost impassable in the breaking up of winter. Now they are as good as a street in Paris, and the improvement has been effected by a liberal expenditure of money, on the principle of securing thorough drainage and stone surfaces.

John B. Moore said that the subject had been fully discussed by the Board of Agriculture, and as a result a law was passed by the Legislature authorizing towns to appoint Road Commissioners. The course authorized had been largely adopted, and had been followed by much improvement. But there were great difficulties in the way, some towns of not more than fifteen hundred or two thousand inhabitants having within their limits two hundred or more miles of road. Such is the case with the town of Chelmsford. An appropriation of fifteen hundred dollars is as much as such towns can afford, and it must be spread out pretty thin to cover two or three hundred miles of road. This difficulty might be obviated by state aid to such towns, but it would be better for a farmer to give away his farm than to pay the taxes necessary to keep such a length of road in a high state of excellence.

The thanks of the Society were unanimously voted to Dr. Slade for his essay. The Chairman of the Committee on Discussion stated that it was the intention of the committee to reserve some Saturday for further discussion of the subject.

MEETING FOR DISCUSSION.

SATURDAY, February 10, 1877.

W. C. Strong, Chairmain of the Committee on Discussion, presiding. The Chairman called on C. M. Atkinson for information concerning a new *Bougainvillea*, exhibited by Mr. Nelson, gardener to Hon. Robert C. Winthrop. Mr. Atkinson said that the species

was received for *glabra*, but was of a different color, and he thought it *lateritia*. It was of very striking and attractive appearance; of brick red or vermilion color and not so gross a grower as *B. spectabilis*.

Lecture on Entomology.

The Chairman then introduced B. Pickman Mann, who spoke on Entomology, in substance as follows: —

The interest of the horticulturist in insects is in their relation to plants, but entomology cannot be successfully studied in this economic aspect without a knowledge of technical entomology. If a person finds his apple trees eaten by an insect, he may not recognize it until it is too late to prevent the injury. If he applies to a neighbor for information, it may prove to be the canker worm, tent caterpillar, palmer worm or some other insect. If it is a canker worm he must provide against two kinds which have very different habits, — the fall and spring canker worms. The former comes out of the ground in the autumn, and continues to ascend the trees until April, excepting from the middle of January to the end of February, crawling on the trees and laying its eggs in patches on the bark. The other does not make its appearance until spring, and can be distinguished by the possession of a long tube, by means of which it lays its eggs in crevices, etc. If the insect proves to be the tent caterpillar (*Clisiocampa*), the cultivator must know the proper season to attack it. Frequently the best time to attack insects is when they can only be discovered by search. The chrysalis of the cabbage butterfly is readily accessible, and is attacked by a little wasp, so that in destroying the chrysalis we may destroy many of our friends, as may be proved by collecting a quantity of the chrysalides and placing them in a wire cage, when it will be found that a large proportion will produce no butterflies, but there will issue from them many of the little wasps which have been the cause of their destruction. These considerations show the importance of such an exact knowledge of insects as can only be acquired by a special student.

Of 200,000 known species of insects we have 30,000 in this country, and of this number, not a large proportion, — only about 2,000 species, — are so injurious as to be of importance. Some knowledge of insects can be obtained empirically or by tradition, but it is often misapplied; the means which have proved effectual in

destroying one insect are used for an entirely different one, or the remedy is applied too early or too late, creating distrust of entomological knowledge. At times insects appear in great numbers which have never appeared before. Most of our destructive insects are imported from Europe, and have driven out the native kinds, as foreign weeds have superseded the indigenous. American insects are of a more ancient and less improved type than the European, and can no more cope with civilized European insects than the red man can cope with the white man.

Mr. Mann reviewed a recent publication upon the subject of his lecture, to show that neither experience in horticulture nor in any other walk of life, would avail for the protection of plants from injury by insects, unless a knowledge was gained of the insects themselves, and that any number of isolated observations, however accurate in themselves, might lead, as in the case mentioned they had led, to the most erroneous conclusions, unless that thread of interpretation was seized upon, which could only be grasped with certainty by persons who had made the insects themselves objects of study.

He then gave an account of the principal insects known to be injurious to currant bushes in this part of the country, pointing out their differences in appearance and in habit, and the different measures necessary to adopt in order to prevent or diminish the injury caused by them.

1. The tender tips of the currant bushes are cut off squarely in the night by the caterpillar of a moth known as *Hadena arctica*, a description of which may be found in Dr. Harris' "Treatise on Insects Injurious to Vegetation," edition of 1862, p. 450. This caterpillar is not known to cause any other injury to the currant bush.

2, 3. The caterpillars of two insects, one a moth, *Ægeria tipuliformis*, and the other a beetle, *Psenocerus supernotatus*, consume the core of the stems, weakening the plant both in its power of work and in its power of resisting breakage, or quite killing it. These insects are best attacked by breaking off in winter the stems containing the chrysalis and burning them.

4, 5. The caterpillars of two other insects, one a moth, *Ellopia ribearia*, and the other a saw-fly, *Nematus ventricosus*, consume the leaves of the plant, thus checking or destroying the growth of the fruit and eventually that of the whole plant. The former of

these two is a measuring worm, which lays its eggs upon the stem and branches of the bush, where they remain all winter and may be found and destroyed. Bushes from the nursery should be examined so that the insect may not be introduced into places now exempt. The latter is of European origin and has of late been so destructive as to be known as *the* currant worm. The perfect insect comes out of the ground in May, and finds the leaves ready; it lays about a hundred eggs on the under side along the principal veins, where they can be seen by turning up the leaves, which should be plucked off and burned. This is the easiest method of destroying this insect. If the eggs are allowed to hatch, the worms immediately begin eating the leaves, at first making little holes, which they soon enlarge, afterwards eating the edges, and then going to other leaves. The worms should be gathered and crushed or thrown into boiling water. When they have finished eating they go into the ground and form a cocoon near the surface, or under leaves. If the ground is smooth and hard under the bushes, or if boards are laid over it they are, in a measure, prevented from doing this. There are two broods in a year, the second being much more numerous than the first. The earlier they are attacked the better. These details will serve as a specimen of the treatment which injurious insects ought to receive.

These five are the most important enemies of our currant and gooseberry bushes, but a large number of others are known, which do, at times, very severe harm to the same bushes.

A repetition of the descriptions of these insects, would only add to the large number of times the same have been described. Experience has shown that little attention is, as indeed from the nature of the case must be, paid by practical horticulturists to accounts of the habits and descriptions of the forms of these insects, for while the description itself might be simple, the interpretation of it requires some knowledge of the several tens of thousands of other insects found also in this country. By way of illustration, Mr. Mann drew a parallel between the practice of economic entomology as a profession, and the practice of medicine. While every person might be competent to study the nature of any one disease, and to administer the proper remedies, the very great number of diseases and the necessity of immediate readiness to cope with any one, made it only possible for persons who devoted their whole attention to the subject to undertake the task of practising medicine. So it is

with the entomologist. It will not be until the horticulturist or the farmer calls in an entomologist to prescribe for insect ravages, that these can be reduced within reasonable limits. Every one will admit, when the ravages are in progress, that a remedy for each kind of injury alone would be of immense value, but few can command the means of being at the same time cultivators of plants and proficient students of the insects which are injurious. Moreover, much of the greatest protection afforded to plants comes by the agency of insects, whose labors must be understood and appreciated before they can be secure against destruction.

Mr. Mann called attention to the action of several of the states in the Mississippi valley, especially the state of Missouri, which has maintained a State Entomologist at a salary of two thousand dollars a year for nine years. The labors of this entomologist have been recognized as of very great value, and have brought to him, among other tokens of esteem, the gift of a gold medal from the government of France. Illinois and Tennessee, as well as other states, have maintained State Entomologists, and the State Agricultural Society of New York, has declared that the labors of the entomologist employed by it have been worth fifty thousand dollars a year to that state.

Mr. Mann expressed the opinion that the services of a State Entomologist would be of equal value to our own commonwealth. The state of Massachusetts has received the benefit of the labors of Dr. Packard, of Salem, for several years, but in such a way that Dr. Packard has been obliged to bear part of the expense of the publication of his reports in the "Report of the Secretary of the State Board of Agriculture," while receiving no pay for his labor. Mr. Mann thought it of the utmost importance for the horticulturists of this state to secure a recognition of their claims, and that addresses upon entomology were of little avail towards the diminution of the ravages of insects in any other way than by arousing the people to a realization of their rights and their best interests.

Discussion.

The Chairman said that none of us realize the great injury from insects, which is increasing rather than diminishing, as the Colorado beetle and other new insects make their appearance. He regretted that we should be so far behind Missouri and other states, in our measures to attain to and disseminate a knowledge of injurious in-

sects, and thought it desirable that the Society should be represented on the State Board of Agriculture, where it might assist in procuring the appointment of a State Entomologist.

C. M. Hovey agreed with the Chairman that the Society ought to be represented on the Board of Agriculture, but said that it should be remembered to the credit of our state that it was the first to move on this subject, by the appointment of Dr. Harris to make a report on the injurious insects of Massachusetts, which has served as the foundation of the reports of other states. Mr. Hovey spoke of the difference between European and American insects, and said that the phylloxera does not seem to be very injurious to our American vines.

N. B. White said that he had destroyed large numbers of the cut-worm moth, by placing a light in a tub of water mixed with oil, about the last of May or first of June. He counted what were caught in one night, up to five hundred, which was not a quarter part of the whole.

Mr. Mann, in reply to an inquiry as to the scientific name of the cut-worm, said that one of the most common kinds is *Hadena devastator*. Another common species is *H. clandestina*. In Riley's first (Missouri) Report on Insects, twelve important distinct kinds, that hatch into moths, are described, and several are figured. The remedy adopted by Mr. White is one of the best. The speaker had not been aware of any cut-worm whose caterpillar is a moth, attacking grass. The army-worm cuts off grass above the surface.

C. M. Hovey remarked that the cut-worm attacks young seedlings, seriously injuring whole fields when just springing up.

Mr. Mann said that Mr. White was correct as to the best time for destroying the common cut-worm moth, but that there were twelve hundred moths of this family, and a hundred of the genus mentioned, and that other species than the one mentioned appear at different seasons. In July and August there are few perfect insects. Observations on the time when insects appear are important, and it is desirable that when any insect not before observed makes its appearance, specimens should be sent in quantity to entomologists. Specimens of any insect not known or recognized are also desirable.

The number of first-class original observers in this branch of natural history in this country, is very small, and all the results of their observation are contained in a small compass. Dr. Harris is

unsurpassed in his power of presenting the subject familiarly, but the greater part of the most valuable details about our own insects have been discovered since his time, through the impulse he gave to the study. Nothing of economic importance was added to the later editions. His book, with Dr. Fitch's New York Reports, * Riley's Missouri Reports: the * Illinois Entomological Reports, by Walsh, and afterwards by Le Baron: Walsh's papers in the Proceedings of the Entomological Society of Philadelphia, and in the *American Entomologist in connection with Mr. Riley, and the * Practical Entomologist, are the most desirable works on the subject for horticulturists, and those marked with a star may all be purchased for twenty dollars. Much important detail may be found in other works.

The spring brood of currant worms is apt to be divided into two parts, one appearing earlier than the other. This is the case with many insects, and frequently a third portion will remain over until another season. This is apparently a provision of nature to secure the continuation of the race.

P. B. Hovey thought the currant borer more difficult to contend with than the currant worm. We might be obliged to cut the bush all away, and a single borer may destroy a plant when grown in tree form.

Mr. Mann said that if the currant borer had gone down to the bottom, the stem was destroyed and might as well be cut off. There is no way of destroying it in the moth form, as it is then small and inconspicuous.

Sweet substances are more available than light to attract insects. Poor molasses and ale, mixed and smeared on the bark of trees or on rough boards, is excellent for this purpose. Townsend Glover, the entomologist of the United States Department of Agriculture, has devised a trap for catching insects, consisting of a box with converging sides and conical entrances, and a light in the centre.

C. M. Hovey suggested that the currant borer might be provided by nature to take away old currant stems and cause the growth of new. The tree form is unnatural for the currant.

P. B. Hovey said that currants bear best on wood three or four years old, and do not form spurs until the second year. He thought that the best fruit was produced on trees, but when the stem is perforated by the borer it becomes so weak as to break, or at least the quality of the fruit is deteriorated.

James Cruickshanks agreed with C. M. Hovey that we must rely on suckers to renew the bush. Old wood bears poor fruit. He had a plantation in tree form, where every bush was killed by the borer before they were three or four years old, and he could find no remedy.

C. M. Atkinson remarked that in Europe currants are always grown on single stems. He had been troubled with a black beetle on his potatoes, which moved by hopping, and bored holes in the leaf. They swept away the whole of one piece of potatoes. He had driven them away by sowing coal ashes over them. He had found a handful of coal ashes, dropped on the spot where a cabbage plant was to be set out, a preventive of club foot and cut-worms.

H. W. Fuller spoke of the grub of the cockchafer or May beetle, which is so destructive to the roots of grass, and whose ravages he had observed on the lawns at Woodlawn Cemetery and at Alvin Adams' estate in Watertown. The history of its life is very curious; the beetle deposits an egg in the ground, from which a soft, white grub is hatched which grows for three years, and cuts off all the fine fibrous roots of the grass so that the sod can be lifted from the earth like a carpet. The third or fourth year it goes down eighteen inches into the ground, and comes out a light colored beetle, which soon grows darker and flies away to repeat its operations. He had found them by hundreds under the turf on the edge of the dead spot in the grass. They are distinct from a similar worm, much resembling them, found in manure heaps. He spread a liberal supply of nitrate of soda on the lawn with good effect, as he thought, the lawn during the next summer not being much troubled by them. He regarded potash, or any good alkali, as the most practical remedy in the case.

Mr. Atkinson said that year before last he applied what coal ashes he had on hand to his lawns, and rolled with a heavy roller, with good effect in destroying these grubs. He thought it more due to the ashes than to the roller.

Mr. Mann said that the use of the roller was one of the most approved ways of destroying these insects; he thought it more effectual in this case than the ashes. Mr. Fuller was right in regard to the larva of the dor-bug growing three years in the ground, but they are not destructive the first year. Dor-bugs are very abundant in some years, and not in others, and in any given case it would be the same three years later.

P. B. Hovey said that Dr. Lodge sent his men out with lanterns in the evening and found these beetles on the under sides of the leaves on the apple trees; he collected a bushel of them.

Mr. Mann said that the beetle of the muck worm, which so much resembles the grub of the dor-bug, was black with the wing covers ridged. The goldsmith beetle clings to the under side of leaves during the day. He did not understand what Mr. Atkinson meant by the black beetle. He spoke of a blistering beetle, a flat beetle, a flea beetle, two millimetres in length, and others, but thought those mentioned by Mr. Atkinson must have been some other species. Many observations had been made on flea beetles, particularly those infesting turnips, and he could give information how to destroy them.

Marshall P. Wilder quoted the statement made by Professor Chadbourne, of Williams College, that the potato beetle could be destroyed at an expense of not more than five dollars per acre. This might be done by planting very early kinds, before the beetles became numerous. The beetles are to be picked off by hand and destroyed, and thus the later crop of potatoes will be less liable to injury. If this is neglected, and the second crop of beetles is allowed to appear, poison must be used, but this will cost more than hand picking early in the season, and poisonous drugs destroy beneficial as well as injurious insects. Mr. Wilder knew of an instance of successful hand-picking in New Hampshire.

Mr. White said that he had seen the potato beetle in Minnesota, and Professor Chadbourne's plan would not succeed when the insects were as numerous as they were there. We have not yet had the potato beetle here in full force, as it has come in the West.

The Chairman remarked on the necessity of concerted action in the matter, for our fences are not strong enough to keep out the beetles coming from our neighbor's grounds.

MEETING FOR DISCUSSION.

SATURDAY, February 17, 1877.

The Chairman of the Committee on Publication and Discussion presided, and before taking up the subject assigned for the day, called for remarks on any of the objects exhibited, especially the

forced lilacs shown by C. M. Atkinson. These were of two varieties, the Persian and Charles X, and were of the natural color.

James O'Brien said that he had forced lilacs this winter, of the natural color, and had found a good demand for the flowers. He prepared his plants by growing them in pots, and thought that if planted in the ground there would be a tendency to make too much wood.

Mr. Atkinson said that he had never attempted to blanch the flowers. He received five or six years ago, from Waterer & Godfrey, twelve Persian lilacs, one or two of which were of a lighter color than the others, and last year a majority of the twelve were white. Mr. Waterer was much surprised when told of it, as he had never heard of a white Persian lilac. They were not, however, pure white. Of the four specimens shown, the Charles X were grafted on the common lilac, while the Persian were on their own roots. Mr. Atkinson described an interesting and successful experiment in blooming lilacs in winter by cutting shoots with flower buds and placing the butts in hot water.

Charles M. Hovey said that his views in regard to the varieties of the Persian lilac were the same as Mr. Atkinson's — there is a pale, but not white, one, which when grown under a high temperature proves quite white. Mr. Hovey referred to the plants shown by Mr. Calder last year, which were probably the old variety, and to his own remarks on temperature and time in forcing (Transactions for 1876, Part I, pp. 43–49). Light and air are necessary to bring out the natural color. The Persian has more compact panicles and is less gross in habit than the old kind, and therefore better adapted for forcing.

The Chairman here introduced the subject assigned for the day, viz., Fertilization and Cross-Fertilization. He felt much interest in the opinion of Prof. Goodale that nature abhors individuality. Prof. Goodale also stated that cross-fertilization in plants is the rule, and self-fertilization the exception. The Chairman was surprised that this ground was stated so strongly, and thought these views conflicted with the doctrine of evolution, as presented by Darwin. But the subject is full of practical interest to us as horticulturists, especially in the cultivation of those plants whose seed or fruit we desire to ripen. We want to know whether we must introduce insects into our greenhouses to fertilize our grapes or strawberries.

Mr. Hovey said that the subject presented by Prof. Goodale required much thought. In his view the ideas of the gentleman who had taken this strong ground in regard to the infrequency of self-fertilization were beginning to loosen a little. He could not subscribe to the doctrine of evolution, and thought that it was only by self-fertilization that nature keeps itself true. The clover of to-day is the same as the clover of a thousand years ago. So also with timothy grass, and many other plants: they are all unchanged. With all the good that Mr. Darwin has done, his writings have been to some extent sensational. It needs much time and many experiments to establish the views presented in the lecture under discussion. Mr. Hovey thought self-fertilization the rule and cross-fertilization the exception.

Mrs. J. W. Wolcott inquired whether Mr. Hovey was certain that clover had remained unchanged for a thousand years, and that the flowers were self-fertilized.

Mr. Hovey replied that if the red and white clovers had been crossed this would have produced a hybrid. We know that a pistillate strawberry is sure to be fertilized if there is a staminate within reasonable distance, and he presumed the clover might be cross-fertilized.

Benjamin P. Ware thought the corn crop a fair illustration of the point under discussion. Farmers know that a perfect ear seldom grows on an isolated plant, showing that it is dependent on cross-fertilization. It is fair to presume that in like manner each head of clover may be fertilized from its neighbor.

John Robinson read from a notice in the "American Cultivator," of Darwin's new work, "Cross and Self-Fertilization of Plants," an account of some interesting experiments with Indian corn, to test the comparative vigor of cross and self-fertilized plants. These were planted in two rows, and "when fully grown the ten tallest plants in each row were selected and measured to the tips of their highest leaves, as well as to the summits of their male flowers. The crossed averaged to the tips of their leaves 54 inches in height, and the self-fertilized 44.65 inches, or as 100 to 83; and to the summits of their male flowers 53.96 and 43.45 inches, or as 100 to 80." The aggregate height of fifteen cross-fertilized plants raised in pots was 302.88 inches, and of fifteen self-fertilized plants, on opposite sides of the same pots, 263.63 inches. The practical points deduced by the editor of the "Cultivator" from these and other experiments by

Mr. Darwin, and which Prof. Robinson thought excellent, were as follows: "We here see how gardeners can improve their plants by sowing mixed seeds of a variety, a result easily attained by purchasing peas, beans, or other seeds, from three or four seedsmen whose seeds of the same variety were produced in different localities, instead of purchasing all of any given variety of one seedsman. This may cause a little more trouble, but, as Darwin, Gower, and Lecoq have demonstrated, the results thus attainable are worthy of extra care in culture. By all seed-growers, for trade purposes, this book of Darwin's should be specially studied, and to them we most cordially recommend it."

Prof. Robinson thought it an outrage to apply the term "sensational" as Mr. Hovey had done, to the writings of such a man as Mr. Darwin, who was acknowledged by every one to be a most accurate observer and a careful and thorough experimenter. Mr. Hovey thinks cross-fertilization the exception and self-fertilization the rule. Others differ from him, and when we see plants arranged like the orchids and willows, where self-fertilization is rendered impossible, we cannot think it strange that they should differ. Prof. Robinson here read from a review of Mr. Darwin's book, in the "American Journal of Science and Art," by Prof. Asa Gray — "That cross-fertilization is largely but not exclusively aimed at in the vegetable kingdom, is abundantly evident. As Mr. Darwin declares, 'it is as unmistakably plain that innumerable flowers are adapted for cross-fertilization, as that the teeth and talons of a carnivorous animal are adapted for catching prey, or that the plumes, wings, and hooks of a seed are adapted for its dissemination.' That the crossing is beneficial, and consequently the want of it injurious, is a teleological inference from the prevalence of the arrangements which promote or secure it — an influence the value of which increases with the number, the variety, and the effectiveness of the arrangements for which no other explanation is forthcoming. That the good consisted in a re-invigoration of progeny, or the evil of close-breeding in a deterioration of vigor, was the suggestion first made (so far as we know), or first made prominent by Knight, from whom Darwin adopted it." Many persons, prominent among them Thomas Meehan, are continually bringing up instances to show that plants are close-fertilized. This is not denied by any scientific man of any repute. In the words of Prof. Goodale, "What is claimed, and what is in perfect consonance with such statements is

this, namely, most plants can be in some way cross-fertilized, and this cross-fertilization, *even in those species which can be close-fertilized*, ensures greater vigor in the progeny."

Prof. Robinson remarked that Mr. Darwin's conclusions were derived from actual experiments, with hundreds of plants, those with some species extending over a period of eleven years. Prof. Goodale mentioned only a very few of the many instances that might be given, of arrangements for preventing self-fertilization.

Mr. Hovey remarked that the bean, so long cultivated and not easily self-fertilized, had never become mixed.

Mr. Ware corroborated this remark. He had never found hybrids among beans.

The Chairman mentioned the squash family as plants which mix easily.

Mr. Ware again alluded to the fertilization of corn, which he thought peculiarly interesting. To illustrate further than before, he mentioned a farmer who had a very superior variety of corn, which his neighbors desired to obtain, but which he refused to part with. To keep it pure he planted it away from all his other corn, but, unfortunately for himself, he planted some on the bank of a river, and a neighbor planted some corn on the opposite side, which was fertilized by the superior variety, and thus seed possessing most of its characteristics was obtained. Mr. Ware also knew a farmer who was famous for his excellent crop of corn, and who would go to any one who had superior corn and get a few ears, which he would plant with his other corn, regardless of the appearance produced by the intermixture; but although the crop would not present a uniform appearance, Mr. Ware thought it a question whether the mixing did not add to the vigor of the plants.

Prof. Robinson remarked that cross-fertilization does not always cause variation. He illustrated Prof. Goodale's views as to the influence of cross-fertilization in suppressing vagaries, by supposing, in a case where seeds of a plant A, produced progeny A, B, and C, that A should exactly resemble the parent, B varying in one direction, and C in the opposite. Should these be self-fertilized they would tend to form three quite marked varieties, whereas should they cross, each with the others, the variation would be broken up, and the third generation would tend to go back to the original, A, especially should B cross with C, the average being A. We find where a race mixes with other races, like the English nation, that

the result is nearer the average type than in an isolated race like the people of Patagonia. The cross-fertilization of clover adds strength to the plants, and that clover is cross-fertilized is probable from the number of bees visiting it.

The Chairman asked if these views did not conflict with the doctrine of evolution; to which Prof. Robinson replied that the tendency to maintain the average did not show that there could not be improvement.

Leander Wetherell remarked that the proboscis of the honey bee is not long enough to reach the nectar in red clover; and, consequently, if bees assist in fertilizing this plant, they must be humble bees. The first crop from a field of clover is always inferior for seed to the second, and this has been attributed to the scarcity of humble bees. It had been doubted by previous speakers whether the red and the white clover flowered together; but they do flower extensively at the same time. Darwin says that insects, whether hive bees or humble bees, visit flowers of the same species so long as they can; hence, where white clover is in bloom, hive bees continue to gather nectar from it as long as it lasts, so that there is significance in the market phrase, "white clover honey." There is no more crossing between red and white clover than there is among beans of different species. The non-fertilization spoken of in an isolated stalk of corn is owing to a deficiency of pollen, more than to the want of cross-fertilization. The same rule holds in regard to animals as to plants—the progeny of a scrub crossed with a high bred animal will be larger than the thoroughbred. In Darwin's experiments tobacco formed a curious exception to other plants; only one crossed plant out of three showed superiority over the self-fertilized. It would be well for farmers and seedsmen to consider the practical points brought out in Darwin's new book.

Mr. Hovey thought that a portion of Mr. Darwin's views, such as those relating to carnivorous and gregarious plants were sensational; but he did not apply that term to his experiments. Mr. Hovey quoted from Prof. Gray's lecture at Mount Holyoke Seminary, in September, 1875, as reported in the "Scientific Farmer:" "All showy, fragrant, and honey-bearing flowers are arranged for cross-fertilization. Nature abhors in-and-in breeding, and, like a wise teacher, shuns it in practice." In the "American Agriculturist" for January, 1877, Prof. Gray says, "Cross-fertilization, we may well believe, is the best thing, but it is risky. Cross-fertilization,

tempered with self-fertilization — which is the commoner case — is practically the best, on the whole, under ordinary circumstances—is the compromise between the two risks, viz.: failure of vigorous and fertile posterity on the one hand, and failure of immediate offspring on the other. Get fertilized, cross-fertilized if you can, close-fertilized if you must—is Nature's golden rule for flowers." Mr. Hovey agreed with Prof. Gray in his later views—he thought cross-fertilization desirable, but carried on at great expense.

The Chairman said that Prof. Goodale's statement was much stronger than Prof. Robinson's. He (the Chairman) had thought the flowers of the *Kalmia* arranged for self-fertilization, but according to Prof. Goodale, it was one of the instances going to prove the rule of cross-fertilization.

John B. Moore said that he had raised three hundred seedlings from the Rivers' Eliza strawberry, and had in every instance reproduced the parent, or else had got a variety not quite equal to it. The case was the same with the Large Early Scarlet, though both these varieties were growing with twenty others. He had found that the simplest and easiest way of producing new varieties was to select a pistillate kind, and plant it away from all others except that with which he wished to fertilize it. In this way he was sure of getting a cross. Corn is one of the easiest plants to operate on. The spindles should all be cut from the variety which you wish to make the mother, before they have fertilized it.

Mr. Moore agreed with Mr. Hovey that Darwin is sometimes romantic and fanciful, and mentioned as an instance the account given by him, and quoted with approval by Prof. Chadbourne at a late meeting of the Massachusetts Board of Agriculture, of an apple tree at St. Valery, "which, from the abortion of the stamens, does not produce pollen, but being annually fertilized by the girls of the neighborhood with pollen of many kinds, bears fruit 'differing from each other in size, flavor, and color, but resembling in character the hermaphrodite kinds by which they have been fertilized.'" Mr. Moore said that an experience of sixty years in the culture of fruit forced him to differ from Prof. Chadbourne. He did not believe anything he saw in a book unless it appeared reasonable to his own mind.

Mr. Wetherell also agreed with Mr. Hovey that Darwin was sometimes romantic, and thought his book on "Cross and Self-Fertilization," the most practical work he had written. This sub-

ject has a practical side, of much interest both to seed growers and seed planters.

The Chairman inquired whether any one had any facts to present in regard to fertilization under glass.

F. L. Harris replied that he had had some success in crossing *Dracœnas*. He had fertilized *Mooreana*, a species having a self-colored, deep bronze leaf, with *regina*, and produced twenty-five plants of which no two were alike, and all partook of the properties of both parents. One of them had a leaf larger than that of either of its parents, and several of them were really superior to either parent. Mr. Butler, gardener at Wellesley College, has crossed *regina* and *terminalis stricta*, and the progeny was much superior to Mr. Harris' seedlings. These were both variegated kinds, instead of a self and a variegated, and more vigorous, yet he produced pigmies, which made most beautiful table ornaments. Mr. Harris operated artificially, first removing the stamens, which he believed to be the true way. He had found *Dracœna congesta* fruit readily, while other species do not; the *congesta* may have been fertilized by insects, and yet this is doubtful, for it fruited in winter when no insects were around. Tropical plants do not fruit readily in greenhouses; he did not believe that a cucumber ever fruited under glass without artificial aid. He thought that grapes had the power of fertilizing themselves so as to produce fruit, but European gardeners declare that it is necessary to syringe the Muscat. He thought the failure to produce fruit under glass might be owing to the absence of insects.

Mr. Hovey said that a breeze was needed to start the pollen. As a general rule the house is kept rather close. The Muscat of Alexandria grape requires heat to burst the anthers. He did not think that each flower would fertilize itself.

Mrs. Wolcott said Mr. Hovey's remarks implied that cross-fertilization would be produced by the current of air.

Mr. Wetherell alluded to the danger of cross-fertilization among plants of close affinity, as the cabbage, squash, and other families. Darwin planted a white kohl-rabi, a purple kohl-rabi, a Portsmouth broccoli, a Brussels sprout, and a sugar-loaf cabbage near together and left them uncovered. Seeds collected from each kind were sown in separate beds; and the majority of the seedlings in all five beds were mongrelized in the most complicated manner, some taking more after one variety and some after another. The

effects of the kohl-rabi were particularly plain in the enlarged stem of many of the seedlings. Altogether 233 plants were raised, of which 155 were mongrelized in the plainest manner, and of the remaining seventy-eight not half were absolutely pure. He repeated the experiment by planting near together two varieties of cabbage with purple-green and white-green lacinated leaves; and of the 325 seedlings raised from the purple-green variety, 165 had white-green and 160 purple-green leaves. Of the 466 seedlings raised from the white-green variety, 220 had purple green leaves and 246 white-green leaves. These cases show how largely pollen from a neighboring variety of the cabbage effaces the action of the plant's own pollen. Such facts reported by so skilful an experimenter and observer as Mr. Darwin, remarked Mr. Wetherell, should be kept constantly in mind by all growers of seed, whether for vegetable or floral culture.

Prof. Robinson said that in many cases the stigma ripens before the pollen is perfected, or *vice versa*.

E. H. Hitchings mentioned the *Sabbatia chloroides* as an instance of the flowers referred to by Prof. Robinson—the pollen ripens before the stigma is mature.

The Chairman remarked that whatever might be thought of the peculiar views expressed by Darwin, he was an earnest seeker for facts.

C. M. Atkinson was sorry to hear any one speak of romance in connection with Mr. Darwin. He thought that, with the same facts before him in regard to the subject under discussion, Prof. Agassiz would have come to the same conclusion as Darwin. Mr. Atkinson mentioned the pelargonium as a plant incapable of self-fertilization, as was shown by Foster and Beck, two of the most extensive experimenters in raising new varieties of that plant. The stamens are ripe before the pistil, and if you wait for seed to be self-fertilized you will never get it. The appearance of purple grains in the ears of white or yellow corn, shows that cross-fertilization has had its effect in that instance. When strawberries are grown under glass, unless they are fertilized with a camel's hair pencil, or a hive of bees is placed in the house, the fruit will be knurly and undeveloped. To produce a perfect strawberry, every pistil in the flower must be fertilized. He had grown, at the late John P. Cushing's, strawberries under glass to measure five and a quarter inches in circumference, when there was a hive of bees in

the neighborhood, some of which came into the house. A current of air is not sufficient.

Mr. Hovey said that it was well to know what we wanted to arrive at, and the question was whether cross-fertilization was necessary to keep up the vigor of the race. He admitted the facts stated in regard to the *Dracœna* and the strawberry. Moisture is unfavorable to the dissemination of pollen.

Mr. Wetherell alluded to the breeding of cattle as analogous to the breeding of plants,* and said that the shorthorns of the Duchess family, bred in-and-in, are the most perfect animals of the cattle kind that the world has ever seen. He spoke of the Duchess cow, at the York Mills sale, that brought $40,600. Though cross-fertilization may produce large and perfect plants, the question is whether individuality can thus be perpetuated. He thought crossing with inferior and unimproved varieties would impair the vigor of plants, and that the less there was of foreign pollen the more perfect would be the plants propagated from seeds.

The Chairman remarked that Darwin produced monstrosities by breeding in-and-in, and that the question is, what we call a perfect plant.

Mr. Wetherell asked whether it was not understood by botanists, that all plants in their original state are perfect, and that the garden varieties are monstrosities.

The Chairman replied, that technically they were, and referred to Darwin's illustration from the gooseberry. It is a fair question how far, in our efforts at improvement in particular directions, we interfere with the general development of the plant.

Mr. Hovey agreed with the Chairman that all plants and trees out of the common course are monstrosities. Cross-fertilization has not kept up the individuality of plants, but has changed it. Roses with a tendency to double, become entirely changed in three or four removes from the original. The wild touch-me-not is precisely the same as it was fifty years ago, but if removed to the garden it would doubtless have been changed. Mr. Hovey asked how such a pear as the Duchesse d'Angouleme, which was found growing wild, was produced. He thought cross-fertilization likely to lead away from the original type.

*The following note is added by Mr. Wetherell: "Sexual reproduction is so essentially the same in plants and animals, that I think we may fairly apply conclusions drawn from the one kingdom to the other." Charles Darwin, in "London Agricultural Gazette," April 2, 1877, p. 324.

Prof. Robinson said that Mr. Hovey had confused cross-fertilization and hybridization. We should keep distinct the perpetuation of the race, and the improvement of varieties.

H. Weld Fuller asked whether Nature was not always exercising a strong recuperative power, and making an effort to protect herself. He thought this power was shown in the tendency of variegated plants to revert to their original type. Darwin is a most careful observer and a faithful recorder; if he believes that certain matter was created with innate power of reproduction, self-preservation, and indefinite renewal, the great Author of that power is not thereby ignored! Darwin does not destroy the necessity of a *first cause*. The endowment of a seed with the capacity of development into varieties remarkable for their beauty or use, is as wonderful as the creation of those varieties would be. Human ingenuity may contrive a clock which may run for a week or a year, but it can give no vitality or endless energy to its materials. It requires a God to construct one which will run through all ages, renewing itself continually and knowing no change or stop. Mr. Fuller thought the principles of hybridizing were well understood; the way is to get the best varieties of everything and breed from them.

The Chairman said that we should endeavor to preserve the distinction between cross-fertilization and hybridization. Prof. Goodale's point is that Nature adopts the principle of cross-fertilization largely for the purpose of suppressing changes.

Mr. Wetherell expressed his satisfaction that Prof. Robinson had made the distinction between cross-fertilizing for the perpetuation of the race and for the improvement of varieties.

Mr. Hovey remarked that the difference between hybrids and other crosses is that the former are not fertile.

The Chairman said that the close attention given to the discussion for two hours showed the practical interest of the subject. A motion was made to continue the discussion the next week, which was carried.

MEETING FOR DISCUSSION.

SATURDAY, February 24, 1877.

W. C. Strong, Chairman of the Committee on Publication and Discussion, in the chair. The subject of Self and Cross-Fertilization, as presented by Prof. Goodale, being again assigned for consideration, the following outline of the lecture, made by Prof. Goodale, was read by the Secretary, that the position of the lecturer might be clearly understood.

I. By self-fertilization, or close fertilization, is meant the impregnation of a pistil by pollen from its own flower.

Conrad Sprengel, in the last century, and Andrew Knight, early in this century, showed that many flowers are incapable of fertilization without insect or other foreign aid.

Mr. Darwin, in England, Müller and Hildebrand in Germany, Axtell in Sweden, and Gray in America, have greatly enlarged the list of flowers which require insect aid to ensure their fertilization. These flowers are termed "cross-fertilized."

II. The mechanism of cross-fertilization may be said to be by

1st. Separation of the sexes.

2d. Different dates of maturity of stamens and pistil.

3d. Inaccessibility of the stigma, as in orchids, etc.

4th. Certain movements which ensure transfer of pollen.

III. Mr. Darwin, in his recent work on cross-fertilization, establishes the fact experimentally that plants which can be, and are, as a rule, self, or close fertilized, become in a few generations greatly impaired in vigor, as contrasted with the same species cross-fertilized, and unequal to contend with them in the struggle for life.

IV. Many disputants of late have asserted with reason, that a good many plants can be self-fertilized. This is not denied by any scientific man of any repute. What is claimed, and what is in perfect consonance with such statements is this; namely, most plants can be in some way cross-fertilized, and this cross-fertilization, *even in those species which can be close fertilized*, ensures greater vigor in the progeny.

It must be noticed that in some recent publications bearing upon close fertilization, the fact that experiments covering many years

are better than those which cover barely one, appears to have not received sufficient attention.

Hybridization, the impregnation of one species by the pollen from another, does not lie in our present path.

The Chairman mentioned the point that if suppression of individuality, was Nature's law, in his view it conflicted with the doctrine of evolution.

Marshall P. Wilder agreed with the Chairman as to the conflict between these views. The subject as illustrated by Prof. Goodale, was new to him, as was also the application of the term cross-fertilization to the fertilization of a flower by another flower on the same stem. Knight and Herbert, in their writings on cross-fertilization, apply it to the fertilization of one variety by another. Though Mr. Wilder had a great regard for scientists, he believed that God ordained that plants should self-fertilize, each plant "yielding seed after its kind." Corn and other plants are kept pure by self-fertilization, so that we get the exact varieties. If a plant fertilized by its own pollen or by a companion, produces a seedling like itself, we have made no progress in improvement. Working horticulturists have discovered that species could be crossed, and the speaker preferred careful cross-fertilization by hand, as the surest method of improvement in the production of new varieties, to impregnation by insects or the wind. We have an absolute law by which we can coöperate with nature in this improvement of species, both animal and vegetable. Lindley says weak parents produce weak children, and their children are still weaker.

Mr. Wilder called attention to a group of eight azaleas, three years from seed, exhibited by him, in fulfilment of his promise at one of these meetings, to produce seedling azaleas in flower in much less time than is commonly supposed to be required.

The Chairman said that the beauty of Prof. Goodale's position is that he is seeking for facts. Our object also should be to ascertain facts.

Mr. Wilder said, in regard to the incapability of plants of fertilizing themselves, that when the anther bursts, the pollen becomes almost ethereal, filling the air like the spores of a puff-ball when burst. The Willey strawberry is a pistillate variety, with large and vigorous foliage, completely hiding the flowers, but if a pistillate variety is growing near, the pollen will so pervade the air as to fertilize every flower under that dense mass of foliage. Some plants

are not so much capable as others of fertilizing themselves. Why do we plant each variety of corn and squashes by itself, but to keep the variety from fertilization by others?

The Chairman referred to the various contrivances described by Prof. Goodale for preventing self-fertilization in orchids.

Mr. Wilder said that varieties were so likely to be impregnated by pollen floating in the air, that when we would fertilize a flower with the pollen of a particular variety, we must cover the style with gauze to prevent fertilization by other than the desired pollen. When we want to raise a seedling possessing the good points of a weak growing variety, but with greater vigor, we impregnate with the pollen of a strong grower; or if we have an excess of vigor, which it is desired to reduce, we reverse the process; and when we have gained the desired improvement, if we keep the plant separate from others we have the same variety to the end of time. The longer he lived the more was he impressed with the importance of cross impregnation, and the more convinced that it is the best way to obtain great improvements. We cannot rely on accidental impregnation for them. Providence seems to have placed in our hands all the data we need for originating improved varieties. Mr. Wilder referred to a paper on hybridization, by Mr. Herbert, published in the "Journal of the London Horticultural Society," Vol. II, pp. 1 and 81, as covering the whole subject of the improvement of varieties.

Edward S. Rand, Jr., asked for any well authenticated fact in relation to the crossing of two well defined species.

Mr. Wilder said that the question was too strict, botanists not being agreed as to what constitute species. The rhododendron and azalea have usually been classed as distinct genera, and yet they cross readily.

Mr. Rand replied that he supposed Mr. Wilder referred to gesneraceous plants, but that he had yet to learn of the crossing of two well defined species. He did not consider the rhododendron and azalea well defined genera.

Leander Wetherell said that the different species of the lily, when growing wild, perpetuate themselves without variation of kind, but when cultivated they produce varieties. The same is true of animals, and he named the Ancon breed of sheep as an instance. If you wish to produce a vigorous race, cross-fertilization is essential. Darwin says that if you wish to perpetuate any peculiarities in a

plant, you may do it by fertilizing from its own pollen, or from that of any other plant of the same stock; but you must not allow cross-fertilization. Some maintain that permanent varieties are identical with species. In hybridizing between species you produce mules. Mr. Wetherell asked whether pigeons of the forest did not perpetuate their kind. Those in domestication show great variation. In the former case man has not interfered; in the latter he has. It is the same with the robin and the squirrel. You can propagate a deformity as well as a beauty. In some instances it is for the interest of the farmer to produce variations. In corn it is not the want of cross-fertilization, but of fertilization, that produces imperfect ears, as shown by a plant standing alone, to which reference had been made by a previous speaker.

E. W. Buswell remarked that the row of corn on the windward side of a field is more deficient in ears than those in the centre of the field, the pollen being blown to leeward.

The Chairman understood the experience of the breeders of fancy pigeons to have a direct bearing on the subject. Darwin claims that he can produce monstrosities in animals, and the principle is the same with plants.

Mrs. J. W. Wolcott asked whether Mr. Wilder had not shown that in almost every instance cross-fertilization is brought about by the aid of man.

Mr. Wilder replied that it was not; the pollen floats in the air, which is so filled with it that if there is a stigma anywhere, the pollen will seize on it as quickly as fire on gunpowder.

M. H. Merriam said that there was much confusion in regard to the original types of plants and animals. His view is that there is a feral type, towards which there is always a tendency to return. A flock of pigeons left to breed in-and-in returned to the feral type in a comparatively short period of time. This, however, is not inconsistent with individuality, but each may have distinct characteristics. Circumstances, known and unknown, produce peculiar characteristics, and hence we have varieties. In the ordinary operation of natural causes, plants will be fertilized both ways, for widely disseminated influences are always in operation to produce this effect, unless special measures are taken to prevent it. There can be no question that self-fertilization does occur, and cross-fertilization does also, because the causes are so universal. The cultivator should guide the process of cross-fertilization so as to produce the

results he desires. The question for him is, how he can unite the properties of two varieties so as to count certainly on the result, instead of leaving it to the operation of natural causes, which elude our control or observation.

Benjamin P. Ware said the question before us is whether Nature provides for self-fertilization or cross-fertilization. It seemed to him that all the facts brought forward as illustrations, tend to show that Nature more generally provides that blossoms should be fertilized from the pollen of neighboring blossoms, rather than from that of their own. The fact that a plant of corn growing alone fails to produce well filled ears shows that it is dependent upon neighboring plants to supply pollen for complete impregnation. The ethereal nature of the pollen of most plants seems to make it peculiarly fitted to be carried by the wind to fertilize other blossoms than those in which it was produced.

Edward S. Rand, Jr., said that Nature aimed only at the perpetuation of the species. This was mainly done by means of seed, and all the various methods of distributing the pollen, by wind, insects, gravitation, or other agencies, were exerted solely with that end in view. Man avails himself of these results, and often Nature's so-called accidents prove superior to the fruit of his best directed efforts.

In reply to a question from Mr. Wetherell as to the fertilization of orchids, Mr. Rand said they were generally incapable of fertilization without the aid of some foreign agency, and that insects were the agents employed by Nature to secure the perpetuation of this class of plants. In performing this service the insects are blind agents, doing the work while seeking food. The orchid flowers are so formed that in order to get at the honey, a violent disruption of the flower is generally necessary, and the sticky masses of pollen are often carried away on the heads of insects, who thus effect fertilization. In illustration of these remarks, Mr. Rand mentioned the singular structure of *Angræcum sesquipedale*, an orchid peculiar to Madagascar. (See the TRANSACTIONS for 1874, Part I, p. 26.)

Rev. A. B. Muzzey thought this subject required a knowledge of science. Sometimes the cultivator appeared distrustful of the scientist in the discussion of questions like the present, and would look only to practical laborers for any reliable information. This should not be; he thought both classes could aid in such discussions. The cultivator could furnish the facts needed in each

case, and the scientist could use them in reaching right conclusions and opinions in horticultural pursuits. They should never be jealous of each other, but should work together as friends and helpers. This would be for the enlightenment and service of the whole community.

During the discussion much had been said of the work of Nature, as if it were a distinct thing from the work of man. But in truth they were both operating in the same direction, if not always in the same way. The mind of man is indeed a part of Nature, and its efforts are designed to be toward the one great end, a perfect culture. It is through man that her highest processes are to be developed. Human means and instrumentalities are essential, both to a correct knowledge and a right use of Nature. This idea would help us in the consideration of our present subject, as in all others of a like delicate and complex character.

John B. Moore remarked that it was fortunate that trees are not liable to be influenced in their fruit by the pollen of other trees. If they were, a man might plant a Bartlett pear tree, and gather any variety or any number of varieties; and where trees were so situated as to receive the pollen of other varieties, we should never be sure what kind of fruit our trees would bear.

E. W. Buswell mentioned a fact of which he was reminded by the allusions that had been made to the manner in which insects follow flowers. Being very fond of humming birds, and noticing that they visited flowers with deep nectaries, he planted large numbers of honeysuckles, four o'clocks, and similar flowers. This plan was entirely successful; his garden was visited by multitudes of humming birds, which grew friendly, and even familiar. A pair of large green humming birds would come and poise on their wings before his face, and play over a bouquet of flowers which he held in his hand.

BUSINESS MEETING.

SATURDAY, March 3, 1877.

An adjourned meeting of the Society was holden at 11 o'clock, President Parkman in the chair.

W. C. Strong, Chairman of the Committee on Publication, an-

nounced that Part II of the TRANSACTIONS of the Society for 1876, was ready for distribution.

WILLIAM E. BOWDITCH, of Boston Highlands, and
HIRAM WILDE, of Randolph,

having been recommended by the Executive Committee, were duly elected to membership.

Meeting dissolved.

MEETING FOR DISCUSSION.

The Chairman of the Committee on Discussion announced the subject of the lecture delivered before the Society by Mr. Halsted, on the 27th of January—Injurious and other Fungi—for discussion at this meeting.

Charles M. Hovey said that the injurious effects of fungi were well known, but it was a question in regard to many diseases in plants, where the presence of fungi was noticed, whether these diseases were caused by the fungi, or whether the fungi were the consequence of the disease. The leaf blight, which attacks the foliage and fruit of the pear in the form of black spots, causing the leaves to drop, is well known to be a fungus. The fungus which causes the potato rot has been thoroughly studied and elucidated by writers in European journals, the "resting-spores" having been discovered within a year or two. The best remedy is to plant early varieties, and to plant and harvest them early, before they are affected by the autumnal rains. We are all familiar with the mildew on the grape vine and with the remedy. Mr. Hovey concluded by expressing the hope that microscopic investigations of all the fungi which are not yet thoroughly understood, would be pursued until some means of preventing the injury which they cause is discovered.

William C. Strong remarked that in some particulars the subject was well understood, but in others it was not well known.

President Parkman mentioned the "fungus of the cutting bench," as one of which nothing was said by the lecturer, but one which comes very near to our feelings, if not to our interests. It is an insidious enemy, which in a night will destroy yards of cuttings, but for which no remedy is known.

Mr. Hovey said that he had found hot, dry sand—as hot as possible without injuring the plants—strewed on the cutting bed, a remedy,

though not complete and thorough. The fungus seems to thrive best in a certain temperature and moisture, which the hot sand corrects.

President Parkman said that prevention is better than cure, and that this was best effected by careful attention to the purity of the sand, and to maintaining a proper temperature and moisture. Where the fungus has destroyed cuttings, the sand is observed to be netted with small white filaments.

Mr. Strong thought the means recommended by the President as a preventive would tend to cure the trouble.

Mrs. J. W. Wolcott asked whether it would not be possible to find the spores and destroy them before the mycelium was formed. It appeared that no one had observed the fungus until it had done the mischief.

President Parkman replied that a long course of scientific observation would be necessary to gain the knowledge suggested, and that such investigation was very desirable. Perhaps by it some remedy might be discovered, as in the case of the plum knot. The observation which can be given by cultivators is not of the minute character necessary. After raising a crop or two of cuttings, the sand becomes filled with vegetable matter, and should be kept continually clean by washing.

Mrs. Wolcott asked if it was not possible to persuade cultivators to accept the discoveries of scientific men, and to save themselves from pecuniary loss by preventing fungus. She thought there was an opposition among gardeners, which was much to be regretted, to accepting and acting upon such discoveries.

President Parkman replied that scientific investigation was as important in horticulture as in other matters, and that the highest practical results could not be had without it.

Mr. Strong thought that we should be modest and not attempt to go beyond our depth in these discussions. He had observed various facts in regard to the fungus under consideration. He had noticed that its growth depended on a humid condition of the soil and atmosphere. He alluded to the remedy proposed by Mr. Hovey, and said that, besides this, thoroughly aerating the sand every time of using would be beneficial.

Mr. Hovey had never noticed any mycelium, more than a web over the bed, which seemed to be composed of infinitesimal particles of water. This web was over, rather than in, the soil—not over

the cuttings, but about a sixteenth of an inch above the surface of the soil. Another kind is quite white, in a thin layer and more distinct. The condition of a bed affected with this fungus appeared to him similar to that of a room so crowded with people that they had not sufficient air. When planted wide apart, with plenty of air, the cuttings do not appear so liable to injury as when crowded. The fungus will go through a bed and kill the base of the cuttings while the top is uninjured.

Mrs. E. M. Gill said that her cuttings were entirely killed, top and bottom.

Mrs. Wolcott asked Mr. Hovey if he did not think that under the web which he described, he could, with a microscope, find the mycelium of this fungus.

Julius A. Palmer, Jr., said that the remarks of the previous speakers would convey the impression that all the fungi were enemies of the horticulturist, but while some of them were destructive of food, others were valuable for food. Among the latter is the *Agaricus ulmarius*, a large white fungus, growing on the elm tree, and which there is no danger of confounding with any poisonous species. The Common in spring is covered with a little black toadstool, *Agaricus* (*Psilocybe*) *fœnisecii*, which is excellent food. Any puff-ball that is white when broken open is not poisonous. So late an authority as Dr. Curtis classed the *Coprinus comatus* among the poisonous species, but it is generally considered harmless. Among the known puff-balls there is not one of those which are white when opened that is poisonous. If on cutting open a puff-ball any trace of yellow is left on the knife, this is an evidence of decomposition, and fungi in this state are as unwholesome as tainted meat. In answer to an inquiry how he cooked puff-balls, Mr. Palmer stated that he broiled them.

James Cruickshanks said that he had been much interested in the facts given us by Mr. Palmer, but he would recommend every one to be very much on their guard as to what they ate. When a journeyman gardener, he saw what he supposed to be some very fine mushrooms. He took them in and broiled them, and ate a portion, and a short time after he was, for two hours, as near being poisoned as ever a man was who escaped. He supposed the hurtful character of these fungi was due to their growing near pine trees.

Mr. Palmer said that the eatable fungi are not marked by their attractiveness, and mentioned a case where a family were poisoned

by eating a white mushroom of attractive appearance. There is only one safe ground, — to know them as well as we know our common vegetables. It would be difficult to describe the difference between the bulb of a hyacinth and that of an onion, yet no one would ever mistake one for the other; and so while it is difficult to describe in words the distinction between different mushrooms, it is not difficult to distinguish them by the eye when once educated to do so. The speaker thought the poisonous qualities of mushrooms exaggerated. He had eaten forty different kinds. There are in Massachusetts perhaps a thousand different varieties—as different one from another as a cherry is from a plum, or a raspberry from a strawberry.

In answer to an inquiry Mr. Palmer said that he did not think there was any danger of finding deleterious species among the mushrooms of commerce, as there is no variety likely to make its appearance in the beds of the cultivator, which he could not easily distinguish from the true kind.

Mr. Hovey said there was no doubt that many of the fungus tribe, the mushroom and truffle especially, are very valuable, forming excellent, agreeable, and pleasant food. Though several are known to be harmless, in our present state of knowledge it is rather dangerous to eat those with which we are not familiar. The *Coprinus* and the common mushroom are distinct, and there is also a small brown one known as the almond mushroom, having a taste like almonds. The common mushroom is well known, and if we get to be as familiar with the family generally as we are with beets and turnips, they would be available as food. At present the number esteemed as wholesome will not count much in comparison with the injurious species.

Mr. Palmer said that the profusion of food in this country was such that we had availed ourselves of the fungi to a very small extent only, but in other countries it was different. The Chinese and Japanese would regard our waste of fungi as we should the rotting of grapes in the vineyard. Large quantities of mushrooms are eaten by the Chinese in California; they are grown in Mexico and imported from thence into San Francisco. The speaker said that he ate the common horse mushroom, or champignon, and regarded them as nutritious. They are rich in nitrogen and take the place of meat, yielding a gravy like that of meat. They live like animals, absorbing oxygen and giving off carbon—the reverse of phænogamous plants.

Leander Wetherell asked whether any of the fungi were poisonous at times, and at other times innoxious.

Mr. Palmer replied that a poisonous species is so from the moment of its birth; a wholesome one is so until it decays. Eventually they are attacked by maggots and go the way of all living things.

Mr. Wetherell said that many farmers have stated that their cattle have been poisoned by eating the corn fungus, while a writer says this is extremely rare. There was more of this fungus the past season than ever before, though it is said to be most prevalent in wet seasons, and the last summer was very dry. He never saw so much in all his life before, as he saw in one cornfield of about three acres; but he heard of only now and then a case of poisoning. He thought the liking for fungi as an article of food, an acquired taste, and he would give the same advice in regard to using them as he did to a young lady who was going out to collect autumn leaves, and asked how to avoid dogwood, ivy, and other poisonous plants, viz.: to gather nothing but what you know is harmless.

Mr. Palmer agreed entirely with the gentlemen who thought no one should attempt to gather or eat mushrooms until they could distinguish between the harmless and noxious so as not to feel the slightest fear. People would sometimes bring him six different kinds for a name, not recognizing any difference between them. He did not think the taste for mushrooms was an acquired one. The noxious fungi have a slimy taste, or an earthy flavor; on the contrary the wholesome ones have an appetizing flavor. We shall never learn the distinction between the wholesome and the poisonous kinds by sitting down and saying that no one knows anything about them.

John C. Hovey said there were many eatable kinds; he had himself eaten seven different kinds. He thought we should study and know them as well as we know a Bartlett pear. Those which he is acquainted with he knows certainly.

Mrs. Wolcott asked whether the discovery of more smut on the corn last year than before, was not in consequence of the failure to take the advice of scientists, and destroy the spores. If there were half a dozen heads filled with smut, that was enough to seed all Worcester county. She thought the farmers might eradicate it if they would.

The Chairman of the Committee on Discussion announced for the next Saturday a discussion on the subject of Dr. Slade's Prize

Essay, the Improvement and Ornamentation of Suburban and Country Roads.

MEETING FOR DISCUSSION.

SATURDAY, March 10, 1877.

The chair was occupied by W. C. Strong, Chairman of the Committee on Publication and Discussion, who remarked that the Hybrid Perpetual Roses exhibited by John B. Moore were the finest ever seen here, and before taking up the topic assigned for discussion, called on Mr. Moore for information as to their culture.

Mr. Moore said that a great part of whatever credit was due for the roses belonged to his son, but that they had not yet succeeded in growing them up to their ideas of perfection. They were grown in pots during the summer, and after the wood was ripened were placed in the house. This was done about the middle of December, previous to which time the tops, and sometimes the soil in the pots, were frozen. He endeavored to prevent rather than to destroy insects, and to this end smoked the plants once a week, whether any insects were visible or not. The only insects he had had besides the green fly, were a few green worms. The plants exhibited were potted on last spring and were bloomed in the same pots that they were in last summer. He shifted once a year; the largest plants were imported two years ago. The pots were plunged two-thirds of their depth in coal ashes, while out doors, and about three feet apart in the full sunlight. Mr. Moore thought it very important to plunge them a sufficient distance apart to give plenty of air between. They were watered once a day, or twice if they needed it, from the hydrant, with considerable force. When the weather became so cold that there was danger of bursting the pots, the space between was filled with leaves. When the plants were first placed in the house the temperature was kept quite low, but afterwards they had more warmth. They were grown in a low house, and there also were watered from a hydrant with a hundred feet head, though the full force was not used. He had been cutting flowers for more than a month. He did not think it made much difference whether the tops were frozen or not, but thought it did some good. The main thing is to ripen the wood.

The Chairman remarked that if frost was not necessary the wood might be ripened much earlier than if it was.

Mr. Moore continued by saying that he was not yet satisfied as to the best way of pruning. Some growers recommend cutting down to three or four buds, but strong growers must be pruned longer than weak ones. He cut enough flowers last summer to pay for the care of the plants.

E. W. Buswell asked Mr. Moore whether he thought it preferable to expose the plants to frosts or to ripen the wood by drying.

Mr. Moore replied that he had practised but one method, — freezing, — though he had withheld water in the fall. He did not think the bottoms of the pots had been frozen, but the surfaces certainly had.

James Cartwright said that he had adopted the same method as Mr. Moore had described, but had planted some out and did not see much difference between them and those grown in pots. He generally froze them, but had some not frozen and did not see much difference.

Mr. Moore said that he struck a lot of plants last spring, which were coming into bloom.

Mr. Cartwright said that he intended to grow all his plants outdoors next year. He thought young plants did better than large ones. He did not think that plants in pots bloomed earlier than those planted out. In his opinion, all the roses forced to bloom at Christmas cost more money than could be got for them.

M. H. Merriam said that from his experience the present winter, he had come to the conclusion that forcing roses which had not been exposed to frost was not successful. There are some plants which it is necessary to ripen off and expose to a certain degree of cold, among which are the lily of the valley and the strawberry.

Charles M. Hovey said there is no frost in Southern California, yet pears are grown successfully there. He did not know that pear trees are benefited by frost. It is true that the California pears are not equal in flavor to those of Massachusetts, but, so far as growth and productiveness are concerned, they have settled the question whether frost is necessary to the pear. It appears from the attempt of Mr. Simpson to grow three crops of grapes in two years, that a period of rest is necessary. The leaves fall without any frost, from want of sufficiently high temperature. To produce fruit there must be a preparation of the sap, which in certain varie-

ties of the pear, such as the Dix, is not effected in less than ten or fifteen years. Time is required to prepare and consolidate the juices. Tea, and other ever-blooming roses, do not succeed if taken out of the ground and put immediately into the house; they require time to prepare for blooming, and should not be pruned too early, but you cannot check the growth entirely. For the majority of our common fruit trees, such as the currant, frost is not necessary.

The Chairman remarked that frost might be beneficial, even if not necessary.

Mr. Hovey did not think it was; Nature, in placing fruits in a northern climate, made them capable of enduring frost, but it is not a necessity to them.

Dr. E. L. Sturtevant's experience had been that exposure to a drought might give results similar to those produced by exposure to frost. The object of frost is to give the plants a rest, and this can be imitated by drought.

Mr. Hovey said that withholding water withholds a certain amount of vigor. Many plants will die if water be withheld for a day or two. Dryness will effect the ripening of the wood, but not as well as dryness with cold.

The Chairman asked, Why stop at the freezing point instead of going lower and giving the plant a more complete rest? He found when fatigued that a nap of a quarter of an hour refreshed him so that he could go on with his work.

E. S. Rand, Jr. said that anything that would produce a rest and a ripening of the wood, would effect the object in view. In our climate the agency is frost; the ripening of the wood of the pear tree is accomplished both with and without frost, according to the climate. Mr. Rand gave an account of his success in forcing roses the present winter. He had a house about twenty-five feet square, filled with roses — almost entirely Gen. Jacqueminot. The greater part of these were struck from cuttings nearly a year ago. They were turned out into the garden, and, the summer being dry, were occasionally watered. They made a good growth, and were taken up the last of November, pruned to from two to six eyes, potted in six inch pots, and placed in a frame which was covered at night. A crust froze on the surface of the soil in the pots nearly an inch thick. They were brought into the house in succession, much air was given, they were allowed to break very slowly, and watered with weak liquid manure. The advantage of year old

plants for cut flowers is that they give single buds, and there is no waste as with the older plants which flower in clusters. There is a great difference in the size of the plants; some have twelve or more buds, and some only three or four.

Mr. Merriam asked whether the effect of frost was not the same as the effect of time and drought, without frost. His plants put in without frost had done poorly.

Dr. Sturtevant gave his views in regard to the effect of drought and frost. When frost strikes a plant there is a change of densities, and in cases there is an apparent transference of nutrient matter from the outermost layers towards the interior. This same movement also seems to occur from the inspissation of sap through drought. The subject is, however, an intricate one, and must be used, if at all, analogically.

Mr. Hovey said it is admitted that the effect of frost is the same as that of heat. In Russia it has been proposed to cook food by subjecting it to intense cold. He had kept amaryllis seeds in a cold room, and they came up in half the time required by seeds which had not been exposed to severe cold. Frost acts as a premature ripening, and if the degree is not too great it does no harm. He had known Tea rose bushes to split open from the effect of frost.

The Chairman said that the practical question for us is, whether there is any way in which we can bring our Hybrid Perpetual roses into bloom earlier than we do now.

Mr. Cartwright said that he had forced this class of roses for seven years. He had always put them into the house the first of December, and the first year he began to cut flowers on the 7th of January; the next year on the 17th; this year on the 3d of February. Generally he began cutting from the 17th to the 20th of January.

The Chairman inquired whether he could not conceive of the ripening of plants so as to start them earlier, and Mr. Cartwright replied that he could not.

Dr. Sturtevant said that by a judicious application of drought he had flowered hardy roses at Christmas.

Mr. Cartwright had had roses in bloom before Christmas, but they cost him a dollar apiece.

Mr. Merriam said that his roses had, unlike Mr. Cartwright's, bloomed unusually early this year. He mentioned an instance where the culture of the grape had been attempted in a very moist climate

in tropical South America with poor success, and the roots of the vine were laid partially bare, thus producing an artificial drought, which caused good crops to ripen.

Mr. Rand called attention to the flowers of *Hexacentris Mysorensis*, exhibited by him. This is a new flower because old, having been introduced many years ago, and since gone out of cultivation. It is a native of Mysore, and a climber like the *Thunbergia*, to which it is closely allied. It produces racemes of richly colored flowers, of unique form, which, though they do not keep long in water, last a good while on the plant, presenting a very graceful appearance.

The discussion on roses continued so long that the special assignment, the Improvement and Ornamentation of Suburban and Country Roads, the subject of Dr. Slade's Prize Essay, was postponed for a week. It was announced that possibly Prof. Stockbridge, of the Massachusetts Agricultural College, might be in town on the next Saturday, in which case he would lecture before the Society on "Fertilizers," and the subject first assigned would be further postponed.

MEETING FOR DISCUSSION.

SATURDAY, March 17, 1877.

W. C. Strong, Chairman of the Committee on Publication and Discussion, in the chair.

The number of plants on exhibition was less than usual, but among them was one of *Rogiera elegans*, which C. M. Atkinson, who was called on by the Chair to give information concerning it, said was a native of the temperate regions of Gautemala, and a very valuable plant for exhibition, as it could always be depended upon for a specimen.

Mr. Atkinson went on to speak of the reports of the weekly exhibitions of the Society in the "Evening Transcript." He alluded to the feverish impatience with which the reports, in the "Gardener's Chronicle," of the London Horticultural Society's

exhibitions at Chiswick were looked for, and said that the reports of our own exhibitions in the "Transcript" were read with much eagerness. He thought it desirable that they should contain the names of varieties in prize collections.

Other gentlemen made some remarks on this subject, after which Professor Levi Stockbridge, of the Massachusetts Agricultural College, was introduced, and delivered a lecture, of which the substance is here given, on

Fertilizers.

Prof. Stockbridge expressed his feeling of obligation to the Society for the opportunity to give his views on a subject which he regarded as of the highest importance to the nation. The first idea that strikes an individual in considering the subject is that it has been discussed year after year and the same questions repeated under no new circumstances. The inquiry arises whether in this matter there is anything settled. Something ought by this time to be finished and made a rule of practice. In endeavoring to arrive at certainty in regard to this subject, we find, first, that there is in the United States, especially in the seaboard states, which have been longest settled, absolute necessity for artificial fertilization. The soil has been tilled so long, and so much has been carried away in the form of crops, that it is far less fertile than when cultivation began. This point being established, it follows, secondly, that the same state of things will always continue, unless the soil is assisted by artificial means. By Nature's processes, all crops decaying on the soil, it becomes marvellously fertile, but when we come we produce an entirely different state of things. All the agencies of Nature work together to prepare plant food, but our power to remove is greater than Nature's to prepare, and will so continue.

The third point is, How shall we supply by artificial means the deficiency which we have artificially created?

The first thing to do is to aid nature in developing plant food by tillage, under which term the speaker included all physical operations on the soil. The next is to put back, as far as possible, all material carried away. We find after using our crops that there is a certain amount of refuse left, and to put that back is the most natural way of supplying food to our crops. This brings us to barn-yard manure, the best fertilizer, for all the general purposes of the farm, that we shall ever find, for it not only feeds the plant, but produces important physical effects on the soil.

Our fourth point is, Will the waste of all material put back on the land in the most advantageous way, keep up its fertility? No, not if every particle is saved. According to the last census, there were in Massachusetts 942,000 acres of tillage land, while the whole quantity of farm yard manure, or fertilizers from the refuse of the crops, was but 422,000 cords—an average of only about one and a half loads to the acre. We must look outside of this source. Is there any substitute? The lecturer answered, Yes, — it is proved, not specially by him, or by Lawes and Gilbert, or by Liebig, or by Dr. Nichols, but by the individual experiments of each, that other substances will do the work of feeding plants.

Farmers ought to take in the fact that plants never feed on manure or soil as such; these become nourishment to plants only when such compound substances are taken to pieces, and separated into their original elements. We speak of piles, cords, or loads of manure, but plants never feed in bulk, either on phosphate in nodules, or magnesia in talc, or soda in mica, or potash in feldspar. These materials are of no use in those forms. The soil must be changed; yard manure must be changed, and that is the reason why we till our soils. Will not potash in the form of oxide of potassium be worth just as much to the plant as in the form of yard manure? Science and common sense say, Yes. There is no other conclusion to come to. In fact it must be better because more readily accessible.

Up to this point scientists and practical men agree — chemicals will answer the same purpose for plant food as yard manure. Are we ready to act on this conclusion? Pure science does not amount to much unless we can put it into practice on the land. We want to go on to our inaccessible, barren hills with substances which will enable us to do there what we do in our home lots with yard manure.

We have a soil that begins to fail. Why? Is it because everything that plants feed on is gone, or because only one or two elements are gone? A plant uses large quantities of potash, which is very scarce and very hard to develop from potash feldspar. In our New England soils the first element deficient is potash, and when this is gone crops refuse to grow. Sterility may result from the absence of one element, and common sense says, supply the missing element. Science further tells us to analyze the soil, to ascertain what the missing element is, and this is also good common sense,

but the trouble is that it is impracticable. The chemist, with his strong acids, will bring out potash where the plant cannot, and therefore he is not a correct guide. Not knowing the presence in the soil of the chemical constituents of plants in available form, is it possible to apply an artificial fertilizer which will supply all their requirements and which may be called a complete manure? It has been proved, and the fact is the common knowledge and property of every one, that in the soil of the seaboard states three elements are wanting, which if supplied will form a perfect manure. In the circumstances in which we are placed to-day, if potash, nitrogen, and phosphoric acid are compounded in proper proportions, we can, as a system, depend upon them as well as upon barn-yard manure, and in some respects they are superior. The question arises, Can we apply this system in practice? and here come in the Stockbridge theory and fertilizers. This theory asks, If these three chemicals make a complete manure, is there any rule by which to compound them for plants? Plants may differ greatly in their composition, and the same plant may have different components in its different parts. Is this composition accidental or in obedience to law? We know that we can compel or tempt a plant to take up unnatural material, but in general the composition of plants is by a fixed law. The manure must correspond to the composition of the plant; that for tobacco or onions must be made different from that for wheat. The Stockbridge theory says, Know your plant, give to it the materials required by its peculiar composition, and give them in soluble form. Other points have been established, and now the question is how to fit the plant. We must make a fertilizer for a potato in one way, and for corn or wheat in a different way, and make it so as to present the food in an available form. The gentlemen present knew something of this theory and how the formula for fifty bushels of corn or one hundred bushels of potatoes is stated. Those who know how much influence is exerted on our crops by the sun, frost, and air, ask whether Nature is not against us in the application of this theory. The lecturer admitted that certainly she was at times, and that owing to causes unknown to us, or not under our control, this system might sometimes fail, but he felt sure that, in the average of ten years, it would produce the results promised. There are a thousand side issues, and many *pros* and *cons*, and many questions may be asked, but an experience of eight or nine years on all soils had given him confidence in the system. It has

been tried and found equally beneficial in all the states, from Maine to Louisiana.

Facts gathered for and against the system, seem to prove that we may by this method very materially lessen the uncertainties which surround cultivators, and make the hills, the remote parts, and the sterile lands of our farms fertile. Prof. Stockbridge closed by repeating the statement that while some of the ideas which he expressed were original with him, others had long been common property, Liebig perhaps being first to publish them.

Discussion.

The Chairman said that Prof. Stockbridge could not have spoken on a more interesting subject, and that he would receive the thanks of all the ladies and gentlemen present. An opportunity would now be given for members who wished to ask Prof. Stockbridge any question, to do so.

William D. Philbrick said that Prof. Stockbridge had very clearly stated his theory, and that he felt that the thanks of the meeting were due to him. But he had not touched on the branch of husbandry in which the speaker was engaged, viz., market gardening. Market gardeners are differently situated from farmers in general, whose supply of manure is limited to the cattle kept on the farm. He could get all the stable manure he needed by paying for it, but he wished to be sure of growing the largest crops at the least expense for fertilizers. He wanted to know whether vegetables could be raised for market on Prof. Stockbridge's system.

Prof. Stockbridge replied that he disliked to go farther in theory than in practice, and that he had no practical acquaintance with market gardening. On a farm he would use chemicals in combination with barn-yard manure. Barn-yard manure is of uncertain composition, and the refuse of English hay and Indian corn cannot make the best manure for a potash crop. Early beets might be manured with part barn-yard manure and part potash, which would be cheaper than to use all barn-yard manure. In reply to Mr. Philbrick's question whether he could carry on a market garden entirely with chemicals, he would say that a market garden being, unlike a farm, tilled all the time, organic matter must be applied in some way, and he thought there was probably no better way than in stable manure, but on a farm it could be applied in a cheaper way, such

as by clover roots decomposing in the ground. He did not think he could do without these on a farm.

The Chairman asked why the organic matter might not be applied in a specific form, as for instance, peat composted with ashes.

Prof. Stockbridge replied, that while the yard manure effects this object, we might also apply straw or sea-weed, or vary the composition to suit the soil. The soil must be kept in proper absorbent condition.

Josiah W. Talbot said that he had made one definite experiment with the Stockbridge fertilizers. He took an acre of old pasture land which had not been manured for twenty or thirty years, and applied the formula for fifty bushels of corn, and kept a careful account of the cost of cultivation and other expenses. The produce was one hundred and thirty-seven bushels of ears, and the cost was not over forty cents per bushel of shelled corn. The fertilizer cost a little less than thirty dollars. In estimating the crop we should value all that we take off, and in this case the fodder nearly paid for the fertilizer. He did not think the land would have yielded fifteen bushels without the fertilizer. He did not try any comparative experiments, but his neighbors had land of the same character, manured with yard manure, which yielded more fodder but no better ears, the crop being about seventy or eighty bushels. He charged himself with all expenses and credited himself with the crop. He did not estimate the interest or the tax on the land, for it was nearly worthless. Applied to grass the fertilizer doubled the crop. On grapes the result was satisfactory. These need potash and phosphate, and but little nitrogen.

John B. Moore said that the Stockbridge fertilizer to produce fifty bushels of corn per acre cost twenty-seven dollars, and the freight was fifty-five cents, which would bring the cost of Mr. Talbot's corn so high that the experiment could not be deemed successful. He doubted whether northern corn was more valuable than southern, and the latter could be bought in Concord for sixty-five cents per bushel. He knew a hundred men who could make a better report than Mr. Talbot's.

M. H. Merriam said that he tried an experiment with the Stockbridge fertilizers on mowing land, which was not satisfactory. He had a field of three acres which had been in grass fifteen or twenty years, and sometimes neglected. A space of average fertility was measured off and the fertilizer applied to it, none being put on the

remainder of the field. The tract where the fertilizer was applied could not be distinguished from that where it was not. It was applied early in the spring and followed by abundant rains. This failure, however, had not shaken his confidence in the general correctness of Prof. Stockbridge's theory, for the road to success is through failures.

Robert Manning gave an account of an experiment similar to that made by Mr. Merriam, which resulted more satisfactorily. In a mowing field an acre was carefully measured, and the Stockbridge formula for English hay and clover was applied. The increase in the crop on this acre over that where no fertilizer was applied was very plainly perceptible, but the whole crop having been sold standing, the exact difference could not be ascertained. He was quite sure, however, that the increase in the crop of last year was not sufficient to pay the cost of the fertilizer.

Mr. Moore agreed with Prof. Stockbridge as to the value of the articles named as fertilizers, but in his view the theory could not be carried out. The formula for potatoes is, to produce one hundred bushels per acre, and in like proportion for other quantities. Suppose you wish to produce four hundred bushels per acre, and apply four times the quantity named, to soil extremely rich in nitrogen. In that case the potatoes would all run to tops, and you would not get any tubers at all. The effect would be precisely the same as every one has seen when potatoes were grown on the site of a manure heap. Mr. Moore agreed with Prof. Stockbridge, that a soil could not be analyzed so as to afford any valuable results to the farmer. Prof. Mapes would invite farmers to send him a little of their soils to analyze, and he would engage to tell them from it what fertilizer to use. Suppose the sample happened to be taken from a spot where cattle had dropped manure; it would then be impossible to arrive at any correct result. Or if you took an average sample there might be half a dozen different kinds of soil in one field. Analysis might show potash where there was none available for plant food. He thought that Prof. Stockbridge had done a great deal of good by bringing about the agitation of this subject, but he could distinguish no difference between the Stockbridge theory and that of Prof. Ville, which was promulgated many years ago. He had used all the articles of which the Stockbridge fertilizers are composed, for years.

Prof. Stockbridge was confident that four hundred bushels of po-

tatoes could be raised by his formula, for it was composed just as Nature compounds the materials when she makes a potato. Nitrogen is volatile and all the time escaping into the air, and if there is any nitrogen in the soil beyond what has been applied, and the plant begins to gather it, it must gather also phosphate and potash. It is almost impossible that there should be a surplus of nitrogen, unless you fertilize with yard manure. It has been asked, Where is the limit — why not make fourteen hundred as well as four hundred bushels? and supply the necessary air, carbonic acid, sunlight and heat. The farmer cannot go farther than Nature will go with him. The points stated by Mr. Moore are nothing new. The speaker was not sure that he knew what M. Ville's theory was, and he would like to know.

Mr. Moore replied that it was so long since he read M. Ville's book that he was unable to give an exact statement of his theory, but the book contained an account of experiments in the growth of plants in distilled water and sand, with the addition of the three substances which compose the Stockbridge fertilizers. In regard to the surplus of nitrogen in a soil, he knew that such a thing was possible. He was well aware of the value of nitrogen, and had used large quantities of plaster of Paris to fix it.

Prof. Stockbridge advised Mr. Moore to apply potash to soils which he suspected to contain nitrogen in excess. The new point with him is, that the best fertilizer for any crop is made by compounding nitrogen, potash, and phosphoric acid in available form and in the same proportions as those in that crop when perfectly mature.

Leander Wetherell read from the translator's preface to M. Ville's lectures on agriculture, as follows: "By adding, according to M. Ville's system, nitrogenous matter, phosphate of lime, and potassa— that is to say, a normal or complete manure—to calcined sand, the seed-wheat being equal to 1, the crop is represented by 23."

Prof. Stockbridge replied that that was not his theory. M. Ville did not make any statement in regard to mingling the substances; he did not say that the best manure for wheat would be made by combining these materials in certain proportions. The only rule given is in the first lecture—so many thousand pounds of yard manure are a good dressing for an acre for two years. If of average quality, it will have so many pounds of each constituent, and mineral fertilizers must be combined in the same proportions, but he does not give any attention to the composition of the plant.

Mr. Wetherell read from M. Ville's sixth lecture,—"First: There exist four regulating agents *par excellence* in the production of vegetables, — nitrogenous matter, phosphate of lime, potassa, and lime. Second: To preserve to the earth its fertility, we must supply it periodically with these four substances in quantities equal to those removed by the crops." Also from his first lecture: "The analysis of all known vegetables, or the products extracted from them, leads to this very unexpected fact, — that fifteen elements only concur in these innumerable formations. These fifteen elements, which alone serve to constitute all vegetable matter, are divided into two groups: — First: The organic elements, which are encountered only in the productions of organized beings, and the source of which is found in the air, and in water. They are carbon, hydrogen, oxygen, nitrogen. Second: The mineral elements, which resist combustion, and which are derived from the solid crust of the globe. They are potassium, sodium, calcium, magnesium, silicium, sulphur, phosphorus, chlorine, iron, manganese, aluminium."

Mr. Wetherell said it was taken for granted that all but the four substances named are contained in the soil; and Prof. Stockbridge had said that chemicals will do just as well as barn-yard manure in making crops. The speaker alluded to the sanguine gentleman who predicted a time coming when the manure for an acre of ground could be carried in the waistcoat pocket, and was answered by another gentleman that when that time came the crop could be carried in the other pocket. Mr. Wetherell asked, Why should we handle barn-yard manure if plant food can be furnished equally well with so much less bulk? If Ville and Professor Stockbridge are right in claiming what they, especially the latter, do, viz.: apply a given amount of fertilizers and harvest a given amount of corn per acre, say sixty or ninety bushels, then has farming become well-nigh an exact science. If the Massachusetts Agricultural College has reached this point it has made a valuable discovery, and only two uncertain points remain: one is atmospheric influences, and the other is the insects injurious to vegetation. If these two points can be settled as certainly as that relative to fertilizers, then farming would be an exact science. Mr. Wetherell concluded by saying that he owned a small farm, and if Prof. Stockbridge confirms his hypothesis, as stated, he should consider the value of his farm more than doubled.

Nathaniel T. Allen mentioned a visit which he paid to an exper-

imental agricultural school in Saxony and to the views of Prof. Nobbe, that eight or nine inorganic elements are required by plants. Prof. Nobbe had these elements prepared, and experimented in the growth of plants in distilled water with the addition of these substances, which mixture he termed "plant soup." A plant of buckwheat so treated grew ten feet high, and, at the time of his visit, had ripened eight hundred perfect seeds, which were afterwards increased to a thousand. Mr. Allen did not see why Prof. Nobbe had not accomplished just what Prof. Stockbridge claimed.

Prof. Stockbridge said that he was not acquainted with this experiment. Prof. Nobbe took a buckwheat plant and supplied it with every thing but soda, giving potash instead, to determine whether one mineral could take the place of another, and found that it could. This, however, does not injure the view that the composition of a plant is fixed by law, any more than the fact that a man can take a considerable quantity of arsenic without injury, by gradually increasing the doses, proves that arsenic is a wholesome food.

In reply to Mr. Wetherell's question, Prof. Stockbridge said that for all purposes of the farmer, considering all the circumstances of the plant and soil, barn-yard manure is the best, but if we consider only the feeding of plants, chemicals are just as good. We use barn-yard manure on our farms because we have it. Fish guano and all other waste materials which contain fertilizing elements, should be scrupulously saved and applied to the soil.

Mr. Wetherell said that the precise point he wished to ascertain is this: If chemicals will do just as well as barn-yard manure, why should a man who has none purchase it, when chemicals are just as good?

Prof. Stockbridge said that he should not, for chemicals would do just as well in feeding crops, and at less expense in handling.

The Chairman remarked that the close attention which had been given to the discussion for nearly two hours, showed the deep interest felt in the subject.

On motion of Mr. Wetherell, the thanks of the meeting were voted to Prof. Stockbridge for his very interesting lecture.

The Chairman announced that next Saturday the subject first assigned for this meeting, viz., "The Improvement and Ornamentation of Suburban and Country Roads," would be discussed.

MEETING FOR DISCUSSION.

SATURDAY, March 24, 1877.

The meeting was called to order by W. C. Strong, Chairman of the Committee on Publication and Discussion, who expressed the hope that none of the gardeners present would leave the room before the close of the discussion, as he thought it desirable that we should compare notes freely. Mr. Strong remarked on the great increase in the number of varieties of the rose forced in winter now, as compared with a few years ago, when the Safrano and Bon Silene were almost the only varieties used for that purpose, and he called for information as to the most desirable kinds.

Edwin Sheppard said that he had found the Comtesse de Serenye one of the best light colored Hybrid Perpetual roses for forcing.

C. M. Atkinson mentioned as among the best, Bessie Johnstone, President Thiers, Centifolia Rosea, and Elie Morel. Pierre Notting is very large, but requires more sun than we get at this season of the year. La Reine is an old variety and a very free bloomer; Mr. Atkinson had had a plant in an eight inch pot, with twenty-two flowers. The color has been called washy by some. Madam Lacharme is admirable for forcing, but does not stand well in summer. Captain Christy and La France are fine new kinds. Caroline de Sansal is third rate in comparison with many modern kinds. Baroness Rothschild is very popular, but a shy bloomer. In freedom of flowering none will compare with Gen. Jacqueminot—it has too many buds. Mr. Atkinson thought that the following named varieties would comprise the cream of the roses best adapted for forcing: Auguste Rigotard, Baroness Rothschild, Beauty of Waltham, Bessie Johnstone, Captain Christy, Centifolia Rosea, Claude Levet, Climbing Victor Verdier, Comtesse de Chabrillant, Comtesse d' Oxford, Cheshunt Hybrid, Duchess of Edinburgh, Dupuy-Jamain, Edouard Morren, Emilie Hausburg, Etienne Levet, John Hopper, Madame Hippolyte Jamain, Madame Lacharme, Madame Scipion Cochet, Madame Victor Verdier, Marquis de Castellane, Mademoiselle Eugenie Verdier, Monsieur Noman, Pierre Seletzsky, President Thiers, Richard Wallace, Paul Neron.

James Cartwright had not found Baroness Rothschild a shy

bloomer; he had had five or six buds on a cluster, and thought it the best light colored variety. It has but little fragrance. Hybrid Perpetual Boule de Neige he thought the best white he had ever seen. It is cup shaped, stands forcing well, and blooms well from spring to autumn, but not as well in winter, appearing to require more sun than we have at that season.

Mr. Sheppard had found Boule de Neige very satisfactory as far as he had tried it; it bloomed well in winter with him. Alfred Auber, a Hybrid Perpetual, is a very fine bloomer, of dark rose color, and very fragrant.

John B. Moore said that he had been surprised to see Boule de Neige growing freely in the border along with Tea roses at Mr. Tailby's. In his view the Baroness Rothschild was the best Hybrid Perpetual to force for market. He thought there were several kinds that bloom as freely as General Jacqueminot. The larger and more double a rose, the less the number of buds produced by it. Cheshunt Hybrid is a very free bloomer; he had had a young plant with fifty buds. Beauty of Waltham is a good rose and of good color.

Charles M. Hovey, remarked that La Reine is one of those productions, which, like the Bartlett and Seckel pears and the Baldwin apple, hold their popularity a long time. When he visited M. Laffay, the originator, at Meudon, in 1844, it was surpassed in form, size, or general beauty, by few varieties, and it still stands among the best. It can only be called washy in contrast to the dark varieties that we have run into of late.

Among the Teas there are many beautiful roses of but little, if any, value for the forcing house, except under certain conditions. Many of them remain closed in the bud and do not open freely. The less double sorts are the most valuable, but they must be cut very early to have them in perfection. General Jacqueminot does not stay long in the bud. Mr. Hovey agreed with Mr. Moore that size in roses is gained at the expense of quantity; the large flowered varieties are difficult to bloom, especially under a high temperature.

Mr. Sheppard, in answer to an inquiry from the Chair, said that he thought Maréchal Niel as profitable as any of the large roses. In a private place he would cultivate the large flowered varieties, but the smaller ones are more profitable for the florist.

Mr. Atkinson was called on to say something of a remarkably

fine specimen of spinach exhibited by him. The seed was sown the last week in August, and on the approach of winter the plants were covered with sedge. The winter was favorable to the keeping of the spinach because the snow came early. He had found that his seedling carnations, of which he had a large bed, came out in admirable order this spring. Feverfew passed safely through the winter and came into flower early. He used large quantities of pine needles for covering; their elasticity made them the best of all materials for covering herbaceous plants which carry their foliage over winter, such as hollyhocks, polyanthus, pansies, sweet williams, etc. He would not uncover so early as this without taking the precaution to cover again if cold, and would not uncover strawberries at all yet. He considered covering in autumn one of the most important points in gardening. He would use sedge in preference to the leaves of deciduous trees, which lie flat and cake together. Tritomas covered with the latter are sure to rot.

The Chairman expressed the opinion that oak and other broad leaves make a good covering. They are apt to blow away, and therefore should have some brush placed over them. If used too freely the plants under them will damp off. He thought the branches of evergreen trees preferable to pine needles, or indeed to any other covering. Stable manure is the worst covering that can be used for herbaceous plants.

John G. Barker, Chairman of the Committee on Plants and Flowers, called attention to a plant of *Aphelexis splendens*, exhibited by J. Warren Merrill.

Mr. Atkinson said that in the grand old days of the London Horticultural Society's exhibitions at Chiswick, this plant was exhibited by Mr. Cole, one of the best plant growers in England. He had seen a plant five feet in diameter, with hundreds of flowers. It should have a very porous soil, and needs silica, and therefore thrives best on peat and sand with plenty of crocks. It requires a somewhat dry atmosphere, and an intermediate house, where the lowest night temperature in winter would be from 35° to 40°. It is a native of the Cape of Good Hope. Other good varieties are *humilis* and *macrantha rosea*.

Mr. Hovey said that the plant is not new, but though introduced many years ago, it has not been seen here of late years. In this country it has been very little grown, and he was doubtful whether

it could be. The plant exhibited, though a small one, was a remarkably fine specimen. In England it has been exhibited at some of the great flower shows as one of twelve magnificent specimens, and in such a condition it is very beautiful, but there were only two or three cultivators who ever grew it so, and even there it has seldom been seen of late. It requires a peculiar temperature and a very dry atmosphere and proper soil; once overwatering will ruin it, and drying is equally hurtful. The treatment should be similar to that of heaths, but it is more difficult to cultivate.

James Cruickshanks said that in his younger days he was acquainted with two or three varieties, and it was then called *Helichrysum*. He knew of a case in which some plants were placed in the cool end of a pine stove, and others in the greenhouse; the latter did best and flowered strongest. He had seen very handsome specimens two feet high and a foot and a half across.

Mr. Atkinson did not agree with Mr. Hovey in regard to the limited extent to which it was cultivated in England. It was more or less cultivated in every collection, whole pits being devoted to it, and it was a common market garden plant. It is a ticklish thing to handle, but easy to grow with right treatment. He thought he could grow it successfully if he watered it himself, but not if everybody put on water from a hydrant.

Mr. Hovey said that one of the causes of failure with such plants as this is doubtless excessive watering from the hydrant. Mr. Cruickshanks had been at Mr. Pontey's, and seen the magnificent specimens grown there. Mr. Hovey had fine young plants many years ago, when they were put in charge of a skilful gardener, and were placed in a house with the azaleas, but they did not succeed—they would go back. We can grow two or three kinds of heath successfully, such as *caffra* and *densa*, but *Cavendishii* and others are much more difficult. Like them, the plant under consideration requires a place where the roots shall not be subjected to too great extremes of heat and moisture.

Mr. Cruickshanks said that the cause of failure was too little care in watering—if too dry the plants are ruined, and if too wet the roots will rot.

The Chairman thought that after so much had been said of the difficulty of growing this plant, many would be disposed to experiment and see just how difficult it is.

So much time had been consumed in the above discussion that it

was voted to postpone the consideration of the "Improvement and Ornamentation of Suburban and Country Roads," for another week.

MEETING FOR DISCUSSION.

SATURDAY, March 31, 1877.

W. C. Strong, Chairman of the Committee on Discussion, presiding. The Chairman remarked on the fine display of plants and flowers in the room, and called for any information that the members might have concerning them. As none was offered, the special assignment, the "Improvement and Ornamentation of Suburban and Country Roads," was taken up. This, the Chairman said, had been postponed, not because of its lack of interest, but because the objects exhibited on previous Saturdays could best be discussed while present before us. Travellers are struck with the excellence of the roads in England, and the park-like character of the scenery—not merely of the places set apart as public parks, but of the country generally. This arises in a great measure from the excellence of the roads, and the hedges by which they are bounded. We think there is no country like our own, but in many respects it is crude and unfinished, and this is especially true of our roads, the margins of which are often in a most untidy condition, even when the carriage way is well kept. The best means of ornamenting roads are not so well defined as the method of forming a good road-bed. In the city of Newton, where the speaker resides, there was talk of establishing a public park, but he thought there was a great work to be done first in the streets, which are now in a scandalous condition as regards neatness. Private ways in such a condition would be a disgrace to the owner, and care and attention should be given to this point before establishing a public park.

Aaron Davis Capen said that a fatal mistake in the ornamentation of streets, was in planting too many trees. As an example of too close planting he pointed to the trees in the cemetery opposite, standing so close as to be drawn up as in a forest. That is the way to plant if a forest is wanted, but not for ornament. He had noticed the planting of trees on the Common, when there were

already three or four times too many. Instead of buying more, he would take up a large proportion of those now growing. The case was similar with many of the ways laid out during the late period of inflation. He could point to trees set out twenty-five years ago, which are now all drawn up for want of room.

John B. Moore said that one of the first steps towards improving the appearance of our roads is to get rid of nuisances. By a recent act of the Legislature, authority is given to towns to pass by-laws, subject to the approval of the Superior Court, for this purpose. The town of Concord, where he resides, had passed such a by-law, and it is now the duty of the road commissioners to remove from the roadsides all piles of wood, manure, stones, rubbish, or other unsightly objects. The people generally have acquiesced in the law, and there has been no occasion for an appeal to the courts to enforce it. The residents in the village have cleaned up the brush, and mowed the grass by the roadsides. The speaker agreed with Mr. Capen that trees were frequently planted too close; he thought elms should be a hundred feet apart. The danger is that if they are planted too closely, with the idea of thinning out, it will not be done. As to thinning the trees on Boston Common, as Mr. Capen would do if he had the power, he would be hung in fifteen minutes after doing it. The speaker did not approve the action of the Society in regard to the Paddock elms, which were so much decayed as to be dangerous. People may like to see walls grown up to a solid hedge with wild shrubbery, but he regarded it as evidence of a poor farmer; it wastes his land and affords a harbor for skunks, woodchucks, and other vermin. He would ornament roads by planting trees or saving those standing, and did not like to see trees planted too regularly, but the first step must be the adoption of by-laws to prevent nuisances.

Leander Wetherell agreed in the main with Mr. Moore, and felt that the Society made a mistake in desiring to retain the Paddock elms. The trees on the Common would not all bear out the remarks which had been made in regard to crowding; some of those on Beacon street had long limbs, reaching nearly across the street, though planted near together. Mr. Wetherell spoke of the influence of trees in keeping roads wet, though perhaps such roads were not well made, and were not underdrained. Trees were sometimes removed on account of keeping the road wet. He spoke of cases where road-masters had ordered trees cut down for this reason. A

well built road might be planted with trees without becoming too wet. Mr. Wetherell alluded to the long and beautiful avenue of trees at Col. Russell's farm in Milton, planted a hundred years ago, and which surprised him by the taste displayed at that early day, and to the roads in Amherst, Northampton, Hatfield, and Sunderland, bordered with beautiful trees. Jenny Lind and other foreigners were attracted to Hatfield, summer after summer, by the beauty of the elms. Mr. Wetherell said that although there are objections to trees, he was not opposed to planting them, and it was delightful to pass through a street lined on both sides with rock maples, which tree he thought was surpassed by few for ornamental street planting. It succeeds better than the elm, and, though not as graceful, is clean and free from vermin in summer, and far more beautiful in its autumnal hues. Large quantities of sap for sugar making are in some places drawn from rock maple trees growing in the street.. Mr. Wetherell spoke of the general formation of tree planting associations through the country, and agreed with Mr. Moore in regard to the good effect of the by-law mentioned by him. He would remove hedges from the roadside, especially the wild cherry trees, which form a harbor for caterpillars. The eye of a traveller is always attracted to a farm well cultivated inside, and with the road kept clean and neat outside, yet he regretted to see in New England so many good farms and farmhouses where the roadsides were covered with woodpiles, tools, timber, carriages, etc., lying and rotting, in a manner betokening the utmost slovenliness.

Rev. A. B. Muzzey said that the subject had many bearings, and one of the greatest obstacles in the way of bringing about the desired improvement is the prevalence of the utilitarian spirit. Our fathers, in the circumstances in which they were placed, could not lay out roads properly, and so we find them in the country located without reference to the principle of beauty, which, in its place, is just as important as utility. Roads should be laid out so as to produce a pleasing effect, but regard should also be had to accessibility. Roads were frequently made too narrow, and consequently large sums have been expended for widening them, in Cambridge, where Mr. Muzzey resides, and in other places. Trees should be planted in the right place, so that we shall not be obliged hereafter to cut them down or make the sidewalks with reference to the trees. The fertilization of trees in streets is often neglected, or misjudged as to the material used. The pruning is often

neglected or badly done. If they were pruned when young we should not only be saved much expense, but also much unsightly appearance, and sometimes the life of the tree. If we look at some of these little points we can make very great improvement at small expense.

The Chairman said, in regard to Mr. Moore's objection to hedges, that while they would be out of place in cultivated sections, there were many localities where they would be in harmony with the scenery, and produce a pleasing effect. It is true that the Paddock elms were not sightly trees, and so also the Old South Church is not a sightly building, but trees, as well as buildings, acquire a historical interest, and to cut them down is like showing disrespect to a venerable old man. There is a difficulty in removing unsightly objects from the roadsides, especially when, as is sometimes the case, cities and towns are themselves the greatest transgressors, and we have to educate the public to an appreciation of neatness. Stockbridge and Concord are towns where the streets are not only adorned with trees, but pride is taken in keeping them neat. The speaker condemned the custom of hoeing up the grass in the roads and gutters, as in those adjoining his own estate, where an army of laborers were employed in this work. He had obtained permission, and was removing the clay and gravel from the gutters, and carting in loam, with the purpose of growing grass there and keeping it mown. Nature tries to hide blemishes in the landscape, and it is a disgrace to us if we fail to assist her. A gutter planted with grass will carry off the water on sloping ground without washing. There is generally no necessity for removing clay and gravel, as in his case, but the soil can be cultivated in grass by merely ploughing and seeding.

Mr. Moore said that there was an objection to grass in the gutters on level ground—the water would not run off freely—but where there is sufficient fall it will do.

Mr. Wetherell liked the Chairman's suggestion of grass in gutters, but doubted its practicability in many localities. He could ride for miles in many sections of the commonwealth where the ground was too rough to apply the plan. Some of the railroads in Canada have the sides of cuts made into terraces and grassed, and the road bed also is grassed, which has an excellent effect in preventing dust. Mr. Wetherell spoke of the width of highways, instancing the street at Old Hadley, which must be not far from twenty rods wide, affording ample opportunity for the adornment by

planting trees, which so characterizes the highways in the valley of the Connecticut.

Charles M. Hovey said that we should keep in mind the distinction between suburban and country roads. Back in the country, where there is not a house for miles, the roads are not mainly for the convenience of those who dwell on them, but for passers through. In these places there is not wealth enough, and perhaps never will be, to make such roads as the essayist suggests. When we come within the suburbs of cities we can expect more, but not often even then, in the style recommended. In a suburban residence one wishes to get away from brick sidewalks, and to have things as rural as possible without sacrifice of comfort and convenience. The question is, how to produce the most picturesque effect, without sacrificing these essentials. The roads in Brookline are bordered with grass and barberry bushes, and the grass is cut and the roads are kept in order by the proprietors. These make the pleasantest roads both for pedestrians and riders, but when we come to build up we lose this rural character and need something different. The speaker thought trees entirely out of place in city streets, unless very wide, — as much out of place as in a flower garden. The shade, insects, and falling leaves are often a great annoyance. They should be confined to boulevards, as they are in Paris, and to such places as our own Chester Park or Commonwealth Avenue. The beautiful lime trees in Charles street will soon be a nuisance. He disliked to destroy an old tree, and had erred in not cutting down trees which should have been removed. The treatment of roads must be governed by the character of the place, and the wealth of the people generally is not sufficient to admit of macadamized roads.

The Chairman remarked on the indications that the members of the Society were becoming interested in service in the field, and announced that this would close the series of meetings for discussion this season.

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TRANSACTIONS

OF THE

Massachusetts Horticultural Society,

FOR THE YEAR 1877.

PART II.

BOSTON:
PRINTED FOR THE SOCIETY.
1878.

TRANSACTIONS

OF THE

Massachusetts Horticultural Society.

BUSINESS MEETING.

SATURDAY, April 7, 1877.

A duly notified stated meeting was holden at 11 o'clock, President PARKMAN in the chair.

The Secretary announced an award to the Society by the Centennial Commission, for the Pears collected and exhibited by the Society at Philadelphia in September last, and a similar award for the Apples exhibited at the same time.

The Secretary also communicated an invitation from the Secretary of the New York Horticultural Society, to the members, to attend the exhibitions of that Society.

Adjourned to Saturday, May 5.

BUSINESS MEETING.

SATURDAY, May 5, 1877.

An adjourned meeting of the Society was holden at 11 o'clock, President PARKMAN in the chair.

No business being brought before the Society, it adjourned to Saturday, June 2.

BUSINESS MEETING.

SATURDAY, June 2, 1877.

An adjourned meeting of the Society was holden at 11 o'clock, President PARKMAN in the chair.

The following named persons, having been recommended by the Executive Committee, were duly elected members of the Society:

MRS. SAMUEL P. BURT, of New Bedford,
E. L. BEARD, of Cambridge,
HOWARD GRAY, of Boston.

Prof. GEORGE L. GOODALE, of Cambridge, was, upon recommendation of the Executive Committee, elected a Corresponding Member of the Society.

Marshall P. Wilder, after some remarks on the history and work of the American Pomological Society, moved the following vote, which was unanimously passed:

Voted, That the President appoint a delegation of twenty members of this Society, to attend the meeting of the American Pomological Society, at Baltimore, in September next, and that the delegation have liberty to add to their numbers, or appoint substitutes.

Meeting dissolved.

BUSINESS MEETING.

SATURDAY, July 7, 1877.

A duly notified stated meeting of the Society was holden at 11 o'clock, President PARKMAN in the chair.

On recommendation of the Executive Committee, it was

Voted, To appropriate a sum not exceeding three hundred dollars, for the expenses of entertainments of the Committee of Arrangements for the current year.

The President, in accordance with the vote passed at the last meeting, reported the names of the following gentlemen as delegates to the meeting of the American Pomological Society :—

Marshall P. Wilder, Charles M. Hovey, William C. Strong, Thomas P. James, Charles O. Whitmore, E. W. Buswell, Robert Manning, Hervey Davis, John B. Moore, Benjamin G. Smith, J. W. Manning, James W. Clark, William Parsons, Henry F. French, William H. Spooner, B. K. Bliss, Lemuel Clapp, E. L. Sturtevant, Aaron D. Capen, Frank Andrews.

On motion it was voted that James F. C. Hyde, E. W. Wood, and C. H. B. Breck, be added to the delegation.

William Falconer, of Cambridge, being recommended by the Executive Committee, was duly elected a member of the Society.

Adjourned to Saturday, August 4.

BUSINESS MEETING.

Saturday, August 4, 1877.

An adjourned meeting of the Society was holden at 11 o'clock, President Parkman in the chair.

Agreeably to the Constitution and By-Laws, the President appointed the following named members a Committee to nominate suitable candidates for officers of the Society for the ensuing year :— Charles O. Whitmore, William C. Strong, John G. Barker, John C. Hovey, Patrick Norton, Charles H. B. Breck, and James Cruickshanks.

Marshall P. Wilder, in some appropriate remarks on the services to the Society of Mrs. Harriet S. Buswell, moved the appointment of a committee to present memorial resolutions. The motion was unanimously carried, and Marshall P. Wilder, Charles O. Whitmore, and Charles M. Hovey, were appointed that Committee.

Adjourned to Saturday, September 1st.

BUSINESS MEETING.

SATURDAY, September 1st, 1877.

An adjourned meeting of the Society was holden at 11 o'clock, Vice President WHITMORE in the chair.

On recommendation of the Executive Committee, SAMUEL H. SCUDDER, of Cambridge, was duly elected a member of the Society, and JOHN JAY SMITH, of Germantown, Pa., a Corresponding Member.

Marshall P. Wilder, Chairman of the Committee to present resolutions on the death of Mrs. Buswell, reported the following:—

Resolved, That in the removal of Mrs. Harriet S. Buswell, by death, the members of this Society have lost a lady whose welcome presence was always with us; whose pleasant address, cordial greeting, courtesy and social qualities, and interest in the welfare of our institution, will ever be highly appreciated and kept in mind by the members of this Society, and a large circle of mourning friends.

Resolved, That the above resolution be entered on our records, and that a copy be furnished to Mr. E. W. Buswell, her surviving partner, as expressive of the sympathy of our members in his afflictive bereavement.

The resolutions were seconded by Robert Manning; remarks were made by James Cruickshanks and Charles M. Hovey, and the resolutions were unanimously passed.

The presiding officer read the following letter, addressed to him as Chairman of the Nominating Committee:

BOSTON, 15th August, 1877.

C. O. WHITMORE, ESQ.:

Dear Sir:

With reluctance and regret I beg to say that I am compelled by other engagements to decline again to stand as a candidate for the office of President of the Society, which it has been my privilege and honor to hold for the past three years.

Respectfully yours,

F. PARKMAN.

The Chairman then presented the report of the Nominating Committee, which was read by the Secretary and accepted by the Society.

Marshall P. Wilder, mentioned the arrangements which had been made for the accommodation of delegates to the Pomological Society.

Meeting dissolved.

BUSINESS MEETING.

SATURDAY, October 6, 1877.

A stated meeting of the Society, being the annual meeting for the choice of officers, was holden at 11 o'clock, Vice President WHITMORE in the chair.

The Recording Secretary stated that due notice of the meeting had been given in accordance with the Constitution and By-Laws.

On motion, it was voted to proceed to the election of officers.

The chair appointed Benjamin G. Smith, E. W. Buswell, and John C. Hovey, a Committee to receive, assort, and count the votes given, and report the number.

Voted, That the polls remain open one hour and that the check list be used.

The polls were opened at ten minutes past eleven o'clock.

The Secretary announced the receipt of the Diplomas and Medal awarded to the Society by the United States Centennial Commission, and presented the same.

The polls were closed at ten minutes past twelve. The Committee to count the votes presented their report, which was accepted, and the Chairman of the meeting, in accordance with the Constitution and By-Laws, declared the persons named in the report to be elected officers and committees of the Society for the year 1878.

Adjourned to Saturday, November 3.

BUSINESS MEETING.

SATURDAY, November 3, 1877.

An adjourned meeting of the Society was holden at 11 o'clock, President PARKMAN in the chair.

The President, as Chairman of the Executive Committee, reported a recommendation that the following named sums be appropriated for the year 1878:

For Prizes, ...	$4,575 00
" the Library Committee, . . .	225 00
" the Committee on Publication and Discussion, ...	200 00
" a portrait or bust of the President elect,	200 00

The President reported the following further action of the Executive Committee:—

Voted, That the Executive Committee recommend to the Finance Committee that the unexpended balances of the appropriations for the Library, for the years 1875 and 1876, including that of $600 for the "Flora Danica," be recognized by the Finance Committee.

Voted, To recommend to the Society the passage of the following vote: *Voted*, That the recent action of the Executive Committee, in the application of unexpended balances of appropriations to the Library, in the years 1875 and 1876, shall not be taken as a precedent, but that all unexpended balances of appropriations for any year, after the payment of all bills contracted in that year, shall revert to the Treasury at the close of the year.

The vote recommended by the Executive Committee was unanimously passed.

The following named gentlemen, having been recommended by the Executive Committee, were on ballot, duly elected members of the Society:

Rev. Crawford Nightingale, of Dorchester,
Warren Fenno, of Revere,
M. H. Norton, of Boston,
Daniel Duffley, of Brookline,
William D. Park, of Boston.

The following vote, offered by C. M. Atkinson, was unanimously passed:

Voted, That the report of the Treasurer shall show, in separate items, all expenses incurred of ten dollars and upwards.

Adjourned to Saturday, December 1.

BUSINESS MEETING.

SATURDAY, December 1, 1877.

An adjourned meeting of the Society was holden at 11 o'clock, President PARKMAN in the chair.

The President announced as the first business before the meeting, resolutions in memory of Thomas Rivers, one of the most eminent European horticulturists and pomologists, which would be appropriately presented by Marshall P. Wilder, the foremost American pomologist.

Mr. Wilder thanked the President for suspending the usual order of business that we might render proper honor to the memory of one of the oldest and most respected corresponding members of the Society. He was advised by the memorial card which he held in his hand, that Thomas Rivers died at his residence, Sawbridgeworth, England, on the 17th of October, 1877, aged seventy-nine years. It had been his privilege for nearly fifty years to be acquainted by correspondence or personally, with Mr. Rivers, who was one of the most eminent horticulturists of the age. As a nurseryman, pomologist, tree and rose grower, and especially as a hybridizer, producing and disseminating new and choice varieties of fruits and flowers the name of Mr. Rivers would long be remembered with veneration and gratitude. For nearly sixty years he was actively engaged in the nursery business, and it can be said with truth, that no man in all Europe ever maintained a higher character for fidelity and integrity. As a pomologist he would be remembered for generations to come, especially for the production of new and valuable fruits from seed, which exercised a fascination over him; as he said "growing with his growth and strengthening with his decline." As a raiser and introducer of new fruits, the editor of the London "Gardener's Chronicle," (than which there can be no higher authority), said of him, "the name of Thomas Rivers stands pre-eminent. We have had no English pomologist to compare with him in this department, if we except Thomas Andrew Knight." The same paper gave a list of more than seventy new varieties of fruits raised and sent out by him. Mr. Rivers considered as one of his greatest triumphs, the production of early peaches, by which the season is extended for several weeks, and

which are now distributed throughout the fruit growing world. As a lover of the rose, and the great leader in its improvement in England, his name will be embalmed in the hearts of grateful millions, while the rose shall unfold its petals to the morning light, or shed its fragrance on the passing breeze. Of his love and devotion to the rose, it has been remarked that "Age cannot wither his loyalty, and beneath a hundred medals, orders, and clasps, his brave heart is still with the rose." His catalogue of roses, published forty-four years ago, was pronounced by Mr. Loudon the most useful one in the English language.

Besides writing many excellent practical works on horticulture, Mr. Rivers had been for many years a large contributor to the periodical press, and his various books and papers on the rose, the pear, root pruning, double grafting, the construction of orchard-houses and other cheap protections against the uncertainties of an English climate, and on other subjects, are among the most valuable contributions to horticultural literature.

Mr. Wilder said that time would fail him, were he to attempt to enumerate the various ways in which Mr. Rivers' name has been associated with the progress of rural economy and the horticulture of the world. Truly it might be said of him, "His works do follow him." His books are the best record of his life.

Mr. Wilder closed by presenting the following resolutions: —

Resolved, That in the death of Thomas Rivers, one of the oldest and most respected corresponding members of this Society, we recognize, in common with the horticultural world, the loss of a friend of horticultural science, rural improvement, and ornamental culture, and a benefactor to our race.

Resolved, That while we deplore the loss of so useful a man, we desire to thank the Supreme Disposer of all events that he was spared to us for so long a course of years, and was at last gathered to his fathers "like a shock of corn fully ripe in its season."

Resolved, That the members of this Society sympathize sincerely with the bereaved family in their affliction, and that a copy of these proceedings be forwarded to Mrs. Rivers as a token of the respect and esteem in which her late husband was held in America.

William C. Strong testified to the sense of obligation which he, in common with other horticulturists, felt to Mr. Rivers for his many suggestive and successful experiments, especially in the construction of cheap orchard-houses.

James Cruickshanks spoke of visiting Mr. Rivers and seeing his extensive nurseries, and meeting with kindness and attention more than could be expected or expressed.

President Parkman said that his first introduction to a knowledge of the rose was through Mr. Rivers' book, in which he had recorded his ample experience in the culture of that flower. The book is full of the honest enthusiasm of his character, which here found expression in regard to the rose. At the time it was written, Mr. Rivers was more prominent in rose culture than any other Englishman, and with its progress he stood at least equal to any one who has written on the subject. He afterwards wrote on orchard-houses, and a passage in the preface to his work on this subject, in which he dedicated the profits resulting from it to the repair of the parish church in which his family had worshipped for generations, showed the quality of the man. Although the speaker had no personal acquaintance with Mr. Rivers he felt, in common with all horticulturists, that we had lost one of our leaders.

The resolutions were seconded by Robert Manning, and were unanimously passed.

W. C. Strong, Chairman of the Committee on Publication and Discussion, read the Annual Report of that Committee.

Waldo O. Ross, Chairman of the Library Committee, read the Annual Report of that Committee.

J. H. Woodford, Chairman of the Garden Committee, read the Annual Report of that Committee.

Benjamin G. Smith, of the Committee on Fruits, read the Annual Report of that Committee.

The above mentioned reports were severally accepted and referred to the Committee on Publication.

Hervey Davis, Chairman of the Fruit Committee, called the attention of the Society to the recommendation in the report of that Committee, that the Prospective Prize of sixty dollars, for the best Seedling Hardy Grape, be awarded to John B. Moore, for the Moore's Early.

It was moved by John G. Barker and seconded by James Cruickshanks, that the recommendation of the Fruit Committee be approved by the Society.

N. B. White moved that the award be postponed for one year.

The vote passed January 13, 1877, relative to Prospective Prizes,

was read, and the subject was discussed. Remarks were made by John C. Hovey, E. W. Wood, W. C. Strong, N. B. White, and B. G. Smith. Mr. White's amendment was rejected, and the motion to approve the recommendation of the Fruit Committee, passed in the affirmative.

John G. Barker, Chairman of the Committee on Plants and Flowers, read the Annual Report of that Committee.

Charles N. Brackett, Chairman of the Committee on Vegetables, read the Annual Report of that Committee.

Robert Manning, Secretary, read his Annual Report.

These reports were severally accepted and referred to the Committee on Publication.

The President, as Chairman of the Executive Committee, reported the list of prizes to be offered for the year 1878.

Further time was granted to the Committee of Arrangements to present their report.

On motion of N. B. White, it was

Voted, That all Prospective Prizes shall be awarded only to the originators of the productions for which such prizes are offered.

Meeting dissolved.

REPORTS.

REPORT

OF THE

COMMITTEE ON PLANTS AND FLOWERS,

FOR THE YEAR 1877.

By JOHN G. BARKER, Chairman.

The closing year again reminds us of our duty to report our doings for the past season, and it is with great pleasure that we can say to the Society that this department has been well sustained through the entire year. The interest in the impromptu exhibitions seems to increase with each season, some of Flora's choicest productions having been presented at these shows. The Rhododendron Show, although the contributions were not as large as in previous seasons, was one of the very best ever held by the Society, the splendid stands of new and choice varieties from H. H. Hunnewell being by far the best ever exhibited. The Rose Show was a grand success and gave great satisfaction to all, both visitors and contributors, and it is very gratifying that so many sent their contributions, adding much more to its interest than if the whole show were made up and all the prizes taken by a few contributors. There are a great many roses grown in this vicinity, and by skilful growers, and there is no reason why this should not be one of the best, if not the very best, show of the season. The weekly exhibitions have been well attended, and the contributions kept up to a good standard. The Annual Exhibition, as we all know, was one of the very best ever held; at no time have the plants been any better, and the superb specimens from H. H. Hunnewell have never been equalled. The prizes were nearly all competed for, thus showing a lively interest in the exhibition. The Chrysanthemum Show has taken its place among the best, as the

last fully proved. We have been permitted to welcome all our old or regular contributors, with the addition of some new ones.

Cyclamens.—There are but very few plants that will pay the cultivator better for his time and trouble than the cyclamen. As a decorative plant for both the conservatory and the window it is one of the most desirable, and as a florist's flower it is equally good, as the flowers can be used to very great advantage, and with care may be had from Christmas to May. The plants exhibited the past season have been exceedingly good. The exhibitors were James O'Brien and C. B. Gardiner. Particularly noticeable were the superb specimens shown by Mr. Gardiner on the 3d of March. The large plants which attracted so much attention were five years old from the seed, the largest measuring eighteen and one-half inches in circumference. Mr. Gardiner informs us that he has picked from it in the seasons of 1875 and 1876 an average of three hundred and eighteen blossoms, and it appears to have full as many this season. Indeed all the plants exhibited at this time were the best ever shown, each one being a mass of beautiful foliage with well shaped, richly colored flowers, and although all were not quite as large as the one mentioned, they must have had at least from one hundred and fifty to two hundred blossoms on each plant. Mr. Gardiner's mode of cultivation is to dry them off entirely during the summer and place them under the benches in the greenhouse. The compost used is good garden soil, muck, and leaf mould, in equal parts, with a little sand. Mr. Gardiner uses no liquid manure of any kind and grows them in a temperature of from 40° to 50°.

Camellias.—The only exhibitors were Hovey & Co., who on the 3d of March made a very fine display of named varieties, and showed also a handsomely arranged basket of the beautiful seedlings of which mention was made in a previous report.

Orchids.—Although not exhibited in as large numbers as in some previous seasons, good plants have been shown by C. M. Atkinson, of *Phaius grandifolius* (*Bletia Tankervilliæ*), which Mr. Williams in his "Orchid Grower's Manual" describes as a noble evergreen plant from China, growing three feet high, and producing its flower spikes one or two feet above the foliage, the color of the flowers being white and brown; they bloom during the winter and spring months, and last long in beauty if in a cool house. This is a most useful plant for winter blooming, and, when well grown, a noble plant for exhibition.

From E. S. Rand, Jr., came, on the 3d of March, three varieties of winter blooming orchids, viz. :—

Cypripedium hirsutissimum, a rare and beautiful Indian species, which when in bloom will last for several weeks in perfection. The plant shown was the first ever exhibited here, and was a good specimen.

Cypripedium villosum was also a well grown and well bloomed plant. Foliage long, light green; flowers very large, and like those of *C. hirsutissimum* will last for weeks in perfection. It is one of the best of the genus.

Epidendrum ellipticum.—While not a large flowering variety, this is very gay and always in bloom; the plant was a good specimen.

Mr. Rand also exhibited *Cypripedium Dayanum*, a native of Borneo. A fine strong growing species, of the *barbatum* type, with beautiful mottled foliage.

James Cartwright presented the following:

Calanthe Veitchii—a small plant of this beautiful species. On large plants the flower spikes are frequently eighteen inches high; and the blossoms of a rich rose color. It is one of the best for winter decoration.

Cattleya crispa, a very fine free growing orchid from Brazil; the color of the flowers is very attractive, and it is worthy of a place in every collection. It is also known by the name of *Lælia crispa*.

Dendrobium thyrsiflorum, a very showy species, of the habit of *D. densiflorum*, but of stronger growth; the flowers are golden and white and are produced in beautiful clusters.

At the special exhibition of summer flowering varieties on the 21st of July, Mr. Cartwright exhibited the three varieties named below.

Cattleya Loddigesii, a beautiful flowering variety from Brazil; sepals and petals of a pale rose color, tinged with lilac; the lip a light rose, marked with yellow.

Cypripedium niveum, a native of Siam. A very dwarf plant; foliage dark green, with minute white spots; purplish red below; flowers porcelain white, spotted with violet purple.

Phalœnopsis amabilis.—One of the handsomest of the genus, of which the species are few. The plant is of medium growth and produces very beautiful flowers which last a long time in perfection. The flowers are borne on very graceful spikes and are arranged in two rows down the spike. The sepals and petals and lip are pure

white; the inside of the flower is marked with rosy pink. This variety is a native of Manilla and is very properly called the "Queen of Orchids."

W. J. Vass has exhibited small specimens of *Brassavola glauca*, *Oncidium bicallosum*, *Phaius grandifolius*, *Cypripedium barbatum*, *Brassia verrucosa* and *Lœlia purpurata*, all well known varieties, which can be found fully described in any of the books on orchids in the library.

From William Gray, 3d, we had *Cypripedium longifolium*—not as showy as many of the species, but desirable on account of its being in bloom nearly all the time.

From William Gray, Jr., came the following:

Cypripedium barbatum superbum, which Williams, in his "Manual," describes as a fine variety, growing in the same way as *barbatum*, but with the foliage more variegated, and the flowers handsomer, the lip being very dark, and the upper petal having more white; it will last about six weeks in perfection. This makes a fine plant for exhibition.

Cypripedium biflorum, from Mt. Ophir. One of the *barbatum* group, and by some considered only a variety of that species. The flowers are very bright in color, and last a long time in perfection.

F. L. Ames exhibited the two following:

Cypripedium Parishii.—A species of stately growth, with broad, coriaceous, dull green foliage; flowers greenish white and purple, not showy but very enduring. A strong plant of this species will be seldom out of bloom.

Cypripedium Dominianum.—A fine hybrid raised between *C. caricinum* and *C. caudatum*, by Mr. Dominy, in compliment to whom it has been named by Professor Reichenbach. In habit the plant most resembles *C. caricinum*, but the flowers are much larger and brighter colored. The petals remind one of similar appendages in *C. caudatum*, but they are twisted spirally like those of *C. caricinum*. The flowers, which are produced two or three together on tall scapes, are of a greenish yellow color, shaded with reddish brown and spotted with purple. The staminode and the basal portions of the petals are densely set with stiff hairs. It is the first time it has been exhibited.

From Edward Butler came two fine specimen plants of *Calanthe vestita rubra* and *C. vestita alba*, which were two of the best specimens of *Calanthes* ever shown. The *Calanthes* are very beautiful,

and exceedingly useful as winter blooming kinds; they are easily grown, and the flowers are very durable; a collection of orchids is hardly complete without them.

Spring Flowering Bulbs.—The very liberal premiums offered for the past two years in this direction have failed to draw out the competition hoped for. The exhibitors of Hyacinths were C. M. Atkinson and Hovey & Co., each of whom showed very fair specimens. Of Narcissus, Hovey & Co. were the only exhibitors. For Tulips, Jonquils, and Lily of the Valley, there was no competition.

Indian Azaleas.—The special exhibition occurred on the 7th of April, and although there were good plants shown, as a whole they were not up to the standard of former years. The exhibitors were Hovey & Co., Marshall P. Wilder, and C. M. Atkinson. The best six were from Hovey & Co., the varieties being Madame Leon Maenhaut, Guillaume III., Gloire Avant Tout, Madame Louise Van Houtte, Fimbriata Alba, and Flag of Truce. Besides the above, the Messrs. Hovey exhibited many fine varieties from their large collection.

From Marshall P. Wilder, whose enthusiasm as a grower and producer of this beautiful flower knows no bounds, we note the following fine varieties, and append descriptions, as far as we can obtain them, of the rarer ones:

Argus (new).

Baron de Vrière.—Salmon rose, margin white.

Bijou de Paris.—White ribbonned with rose and salmon.

Charmer.—Bright amaranth, good form, and petals of great substance.

Countess of Beaufort.

Gloire de Belgique.—White, striped with rose.

Harlequin.

Jean Van Geert.

John Gould Veitch (new).

Juliette.

Madame Glorner.

Mlle. Louise de Kerchove.

Mrs. Wright.

Philadelphia.

Prince Albert.—Large flower, fine scarlet.

Princess Louise.

Rhenania.—Rosy carmine, beautifully spotted.

Sigisimund Rucker.
Vuurwerk.

From John B. Moore came good specimen plants of the following fine varieties, all in the best possible condition; the flowers large and fine, the foliage healthy and handsomely intermixed with the flowers:

Carl Enke.—Bright rose edged with white.
Decora.
Dieudonné Spae.—Rose, bordered with white and striped with carmine; a fine plant.
Etendard de Flandre.
Flag of Truce.
François de Vos.
Juliana.
Madame Iris Lefebvre.
Marie Lefebvre.
Marie Vervaene.
Vesuvius.

Special attention was directed to a group of seedlings from Marshall P. Wilder, exhibited on the 24th of February. The plants were small, being about eighteen inches high; the flowers were good, but no better than many well known varieties; they were but three years from seed, the principal point being that they were brought into flower in so short a time from the sowing of the seed. As soon as the seedlings were large enough they were grafted on strong growing stocks, by which process they were brought to flower much earlier than if left on their own roots, saving much time in waiting for the result of the producer's labors.

Cinerarias.—It was the unanimous opinion of the Committee that the plants shown by J. Warren Merrill on the 17th of February were the best that have been exhibited for the past ten years. The Cineraria in its improved condition is indispensable in any collection of greenhouse plants; there are very few if any plants so gay and beautiful during the winter months, so that it is highly useful both for exhibition and decorative purposes. The plants, both as to variety of color and good cultivation, were all that could be desired. We hope that the success attained by Mr. Merrill will stimulate others to go and do likewise.

Polyanthus.—The only exhibitor was C. M. Atkinson, who showed six well grown plants. This is an old but too much

neglected flower, and deserves more general cultivation and better treatment than it generally receives. In England, considerable attention is paid to its cultivation. It is one of the earliest spring flowering plants, and will well repay the attention that it requires for successful cultivation.

Violets.—Six good plants in pots were shown by C. M. Atkinson on the 3d of March; the variety was Marie Louise, and the flowers were very large and fine.

Amaryllis.—There was no competition for the premiums offered in April, but A. McLaren exhibited two good seedlings on the 17th of February, and on the 28th of July another which promises to be a good acquisition; the flower large, color bright scarlet with fine white markings through the centre of each petal. From J. B. Moore we had cut flowers of well known varieties. From Francis Putnam very good exhibitions of seedlings which were well worthy a place in any collection.

Pelargoniums.—This exhibition which was held on the 5th of May was not a success, and but very few of the liberal premiums offered by the Society were awarded, and what plants were shown, with perhaps one or two exceptions, were not worthy of any special note. It would seem that with so many florists and amateurs who have fine collections of Pelargoniums as there are in this vicinity, this should be one of the best instead of one of the poorest exhibitions of the Society.

Show and Fancy Pelargoniums.—For these there was no competition, the principal reason being, perhaps, that the time the premiums were offered (June 2d), was at least one month too late.

Calceolarias.—Six fine plants were shown by C. M. Atkinson, which were masses of beautiful flowers and were very ornamental.

Tulips.—A good stand of twenty-five named varieties was shown by C. M. Atkinson, he being the only exhibitor.

Hardy Shrubs were shown by Hovey & Co., Miss S. W. Story, and Miss A. C. Kenrick. There was nothing new or remarkable in these collections, but each was made up of a good selection of well known standard varieties.

Rhododendrons.—June 2d being the special prize day, very excellent collections were shown by H. H. Hunnewell and C. M. Atkinson, and a smaller collection of good varieties from E. Shepherd. Again on the 9th of June, a very superb collection of new and rare rhododendrons was shown by H. H. Hunnewell. Though

many superb collections have been exhibited by Mr. Hunnewell, we feel that we are safe in saying this has never been equalled. Francis B. Hayes also exhibited a small collection. In our last report may be found a carefully prepared list of choice varieties, which we think will be of use to any one about making a collection of rhododendrons.

Hardy Azaleas were shown by Hovey & Co., E. Shepherd, and B. G. Smith, each exhibiting a good collection of choice varieties. We append a list of the ten varieties exhibited by B. G. Smith, which were very fine and showed good care in their selection. No other lists were handed the committee.

Baron Pycke.—Large, orange.
Coccinea.—True scarlet.
Cruenta.—Scarlet, fine.
Gloire de Belgique.
Graf von Méran plena.—Fine rose.
Narcissiflora.—Splendid yellow.
Ne plus ultra.—Extra orange.
Othello.
Princeps speciosa.
Prince Frederick.

The hardy Azalea deserves more general cultivation than it now receives. There is no hardy plant that requires less care; it will flourish well in any good garden soil. The plants may be massed with other shrubs, but produce the best effect in groups by themselves on the lawn. If planted in a partially shaded place the flowers will last much longer in perfection.

Roses.—The plants in pots and the cut flowers shown from time to time have been among the very best contributions placed upon the Society's tables; and for the past two or three years, the annual rose shows have steadily improved. Your Committee thought that the show of 1876 could hardly be equalled, but that of 1877 far exceeded our most sanguine expectations. At the Rose Show held June 20th, William Gray, Jr., exhibited the following new varieties sent out since 1873:

Antoine Mouton.—Fine orange rose; very large, full and fine.

Madame Lacharme.—Very vigorous; flowers very large, full, beautifully formed; while opening slightly shaded with rose in the centre, changing into pure white; a superb rose.

Madame Marius Cote.—Flowers clear red, passing to deep rose; cup shaped; very large, full, fine form; growth very vigorous.

Mrs. Veitch.—Bright rose, streaked with white; free flowering, very vigorous.

Souvenir de Spa.—Flowers large; full and very finely formed; color deep red, with fiery reflex.

Star of Waltham.—Bright pink; good shape; large and full.

For the best twelve varieties the competitors were C. M. Atkinson and Francis Parkman; the collection receiving the first prize contained the following fine varieties:

Baron Adolphe de Rothschild.—Bright red; large, full; fine foliage.

Captain Christy.—Flowers very delicate flesh color, deeper in the centre; very effective, large flower; vigorous.

Charles Lefebvre.—Fine brilliant velvet crimson; large, cupped; considered one of the finest roses in cultivation.

Comtesse d'Oxford.—Bright carmine red; large and full, fine form; a splendid rose.

Etienne Dupuy.—Flowers large, full, well formed; color, bright silvery rose.

François Michelon.—Deep rose, reverse of petals silvery; large, full and globular in form.

John Harrison.—Brilliant deep crimson, shaded velvety black; very effective; a vigorous grower.

Madame Louis Leveque.—Fine, bright, clear rose; very large, full, and globular; imbricated.

Madame Marie Finger.—Bright flesh-colored rose, deeper in the centre; globular form; large.

Paul Neron.—Dark rose; fine form, large and full.

Perfection de Lyon.—Color, bright rose, reverse of the petals lilac; form cupped, large and full.

Of the best six distinct named varieties the exhibitors were William Gray, Jr., Francis Parkman, and John B. Moore. We are not able to give any lists of the six varieties, as none were handed to the Committee.

For the best three named varieties, William Gray, Jr. and John B. Moore were the competitors; the best three were Madame Schwartz, Duc de Morny, and Monsieur Boncenne; the last named is violet crimson, richly shaded; large and full.

Moss Roses.—The only exhibitor was W. H. Spooner, Jr., who showed a very fine stand of choice varieties.

Tender Roses.—In this class James Comley was the successful competitor; his collection contained the following varieties:

Bon Silene,	Niphetos,
Duchess of Edinburgh,	Paul Labonté,
Isabella Sprunt,	Perle de Lyon,
Madame Harriveaux,	Souvenir de Malmaison,
Marechal Niel,	Souvenir de Paul Neron,
Mlle. Marie Berton,	Yellow Tea,

the descriptions of which may be found in any of the leading catalogues.

For twelve Marechal Niel roses, M. D. Spaulding exhibited a good stand, and for twelve of any other sort a very fine stand of Souvenir de Malmaison was shown by James Comley.

In the general display excellent stands were shown by J. S. Richards and E. W. Wood; these were two of the best general displays ever made.

Special Prizes.—The competition for these prizes was very satisfactory. For the best twelve of any one variety the premium was awarded for a stand of Alfred Colomb, a bright fiery red rose; large and full, very effective, and one of the best roses in cultivation.

For the best six of any one variety the premium was awarded for a stand of Louis Van Houtte. The flowers are reddish scarlet and amaranth, shaded with bluish purple; very large and full; a splendid rose.

For the best twelve named varieties the premium was awarded to Francis Parkman for a stand containing the following superb varieties:

Alfred Colomb,	Leopold Premier,
Caroline de Sansal,	Madame Boncenne,
Charles Lefebvre,	Madame C. Crapelet,
Comtesse d'Oxford,	Madame Victor Verdier,
Etienne Levet,	Marquise de Castellane,
Felix Genero,	Paul Neron.

For the best six named varieties the premium was awarded to J. C. Chaffin. The varieties were Baronne de Rothschild, Fisher Holmes, François Michelon, Madame C. Crapelet, Mlle. Bonnaire, and Prince Camille de Rohan.

Besides those shown at the annual rose show, there was exhibited by James Comley, on the 24th of January, a fine lot of cut flowers of Tea roses; also a new Hybrid Perpetual rose, Gustave Revilliod,

a beautiful, satiny pæony rose, large, full and imbricated; and by M. H. Merriam, a good plant of Anna de Diesbach.

March 3d being prize day for Hybrid Perpetual roses in pots, two good collections were exhibited by John B. Moore. Again on the 10th of March, Mr. Moore showed a collection of six varieties in pots; they were Baronne de Rothschild, Captain Lamure, Cheshunt Hybrid, Mademoiselle Eugene Verdier, Marquise de Castellane, and Paul Verdier. It is due to Mr. Moore to say that the plants exhibited by him were the best grown roses in pots ever exhibited, and gave good evidence that they had been grown by skilful hands; the foliage was very large and healthy, and the flowers as near perfection as any one ought to expect.

James Comley has made a fine display of new and other Tea roses; among them we note, besides well known varieties, the following, as new and desirable:

Charles Rovolli.—New.

Duchess of Edinburgh.

Jean Ducher.—Salmon yellow, shaded rose peach; globular, full; extra fine.

Letty Coles.—New.

Mad. Miolan Carvalho.—New.

Marquis de Sanima.—New.

Perle des Jardins.—Straw color; very fine and very desirable; one of the best.

Souvenir de Mad. Pernet.—New. Fine light rose, shaded clear yellow, very effective in color; large, globular form; first class.

C. M. Atkinson also exhibited on the 30th of March and the 7th of April, very good collections of roses in pots, which were well grown plants; among them we noticed the following varieties: Beauty of Waltham, Countess of Oxford, Edward Morren, Marquise de Castellane, Monsieur Pierre Seletszki, and Monsieur Hippolyte Jamain.

Gloxinias.—We regret to again report that there was no competition for the prizes offered for this beautiful flower, which for summer decoration for the greenhouse and conservatory has scarcely an equal. From the ease with which it is cultivated, and the large quantity grown in this vicinity by both amateurs and florists, it would seem that the competition for Gloxinias should be very spirited, but the only ones exhibited at any time were some fine cut flowers

from J. B. Moore, and plants in pots from Marshall P. Wilder on the 2d of June.

Wardian Cases were shown by D. R. Beckford, Jr., Hovey & Co., and Carl Deeterich, which were all well filled, and were fine ornaments for any room, but your Committee think that with some of them too much attention was given to elaborate wood-work; so much, as was remarked in our last report, as to distract attention from the plants. The main attraction ought to be the plants in the case, and not the case outside the plants, although that should be neatly made.

Fern Case.—W. H. Halliday exhibited a very pretty one for a table; also a hanging Fern Case; both were nicely filled with plants in excellent condition, and were worthy a place in any room.

Herbaceous Pæonies.—There was only one small collection exhibited, and these could not be ranked as first class. From Hovey & Co. there were some very fine specimens of Richardson's Seedlings which have been fully mentioned in previous reports, and well sustain the character given them as valuable additions to this handsome species of herbaceous plants.

Sweet Williams.—James Nugent and Harry L. Rand were the exhibitors, with two very good stands. This popular flower deserves a place in every garden; any one can grow it, and it always gives satisfaction. Some of the auricula flowered varieties are very fine.

Native Plants have been exhibited in larger quantities than for several seasons past.

Among the many exhibited by George E. Davenport, most noticeable was a plant of *Vittaria lineata*, a grass like fern growing on trees, from Florida; three varieties of *Trillium*, viz., *T. erectum*, *T. grandiflorum*, and *T. recurvatum*—the last exhibited in 1876 under the name of *T. sessile*, but has proved to be *T. recurvatum;* also, *Cypripedium arietinum* (Ram's Head Cypripedium), *Cypripedium candidum* (Small White Lady's Slipper); *C. parviflorum* (Small Yellow Lady's Slipper); *C. pubescens* (Larger Yellow Lady's Slipper). Again on the 4th of August Mr. Davenport exhibited a very nice collection, all neatly arranged and named. Also, on the 8th of September, *Paronychia argyrocoma* (Silver Chickweed); *Gerardia tenuifolia*, var. *alba* (Slender Gerardia), which is the first time these two have been shown; and *Eupatorium aromaticum*, a very pretty species with a small corymb of large,

white, aromatic flowers. Mr. Davenport has shown many other well known varieties, all named, and adding to the interest of the exhibitions.

E. H. Hitchings exhibited a very fine specimen of *Hottonia inflata* (Water Violet) ; a single flower of *Lilium Canadense* having five petals of pure yellow without spots ; *Habenaria ciliaris*, (Yellow Fringed Orchis), "our handsomest species;" *Sagittaria gracilis* (Pursh), *Eupatorium teucrifolium*, and other rare species. Mr. Hitchings has not exhibited in as large quantities as in previous seasons, but what has been lacking in quantity has been fully made up in quality ; his exhibits have been only of the rarest and choicest varieties.

Mrs. C. N. S. Horner, as in previous seasons, has faithfully performed her part in making this department of the exhibitions successful, having taken the first premium at most of the exhibitions of native flowers.

We have also been permitted to welcome to this department Byron D. Halsted, of the Bussey Institute, whose exhibits have been very interesting and instructive. They commenced on the 9th of June, with twelve species of Fungi, growing upon wild plants, the plants and the fungi growing upon them being all carefully named. At the Rose Show Mr. Halsted presented twenty-five genera of Lichens in fifty species ; and at the Strawberry Show, twenty genera of Grasses in thirty-two species ; two genera in four species of *Juncaceæ;* eighteen Sedges, including seventeen species of *Carex*, and *Eleocharis obtusa;* also twenty-three genera of Fungi in forty species.

On the 11th of August, Mr. Halsted presented sixty-five species of "Wild Plants in Fruit," ranging from trees like the oak and hickory down to grasses, and herbs of even smaller growth. It will be seen that the term *fruit* is here used in its broad botanical sense, including all ripened pistils and their contents, whatever their form or texture, and not, as the word is popularly employed, to designate only those that are edible.

Of the Fleshy fruits, the Berry was represented by *Solanum Dulcamara* (Bittersweet), three species of *Vaccinium* (Blueberries and Cranberry), *Actæa alba* (Baneberry), *Cornus Canadensis*, etc. The Drupe or Stone fruit by *Prunus Virginiana* and *P. Pennsylvanica* (Choke and Wild Red Cherries), *Rhamnus catharticus* (Buckthorn), *Ilex verticillata* (Black Alder), and some *Viburnums*, in-

cluding the showy red fruit of *V. lantanoides*. The Drupelets had a representative in the fruit of the *Rubus villosus* (Blackberry). The Dry fruits had the Akene represented by several members of the orders *Ranunculaceæ* and *Rosaceæ*. The Nut by the Oak, Hazel, Hickory, and Butternut. The Key fruit by the Maple and Birch. The Pod fruits included the *Asclepias Cornuti* (Milk-weed), and several specimens from the Mustard and Pulse families. Some Dehiscent fruits, or those which split open and drop their seeds, were shown in two species of *Lilium*, *Hypericum perforatum* (St. Johnswort), Mullein, etc. Last of all a number of cones of *Pinus* and *Abies* represented the Scaly, Multiple fruits.

Mr. Halsted also exhibited at the same time fifty species of wild flowers.

J. H. Sears exhibited *Draba verna*, and Mary T. Saunders *Draba Caroliniana*.

On the 8th of September, Miss Maria E. Carter exhibited a very interesting collection of *Compositæ*, consisting of seventy-five species. It being the largest number of that order shown at any one time we append a list of the species:

Vernonia Noveboracensis.
Liatris scariosa.
Eupatorium purpureum.
" *sessilifolium.*
" *perfoliatum.*
" *ageratoides.*
Mikania scandens.
Aster corymbosus.
" *macrophyllus.*
" *Radula.*
" *patens.*
" *lævis.*
" *lævis* var. *cyaneus.*
" *undulatus.*
" *cordifolius.*
" *multiflorus.*
" *dumosus.*
" *Tradescanti.*
" *miser.*
" *longifolius.*
" *puniceus.*
Aster Novæ-Angliæ.
" *linifolius.*
Erigeron Canadense.
" *strigosum.*
" *annuum.*
Diplopappus linariifolius.
" *umbellatus.*
" *cornifolius.*
Solidago squarrosa.
" *bicolor.*
" *latifolia.*
" *cæsia.*
" *puberula.*
" *sempervirens.*
" *neglecta.*
" *patula.*
" *arguta.*
Solidago altissima.
" *nemoralis.*
" *Canadensis.*
" *gigantea.*

Solidago lanceolata.
Inula Helenium.
Ambrosia artemisiæfolia.
Xanthium strumarium, var. *echinatum.*
Rudbeckia laciniata.
" *hirta.*
Helianthus divaricatus.
Coreopsis trichosperma.
Bidens frondosa.
" *chrysanthemoides.*
Maruta Cotula.
Achillea Millefolium.
Leucanthemum vulgare.
Tanacetum vulgare.
Artemisia vulgaris.
Gnaphalium polycephalum.
Gnaphalium uliginosum.
Antennaria margaritacea.
Erechthites hieracifolia.
Centaurea nigra.
Cirsium lanceolatum.
" *muticum.*
" *pumilum.*
" *arvense.*
Lappa major.
Cichorium Intybus.
Leontodon autumnale.
Hieracium Canadense.
" *scabrum.*
Nabalus albus.
Taraxacum Dens-leonis.
Lactuca elongata.
Sonchus oleraceus.

On the 2d of June, C. W. Jenks exhibited a very fine specimen of *Cypripedium acaule*, var. *alba*. From Mrs. J. W. Wolcott, on the 20th of June, we had very fine specimens of *Habenaria fimbriata*, var. *alba*. From Mrs. J. W. Wilmarth, on the 11th of August, *Sabbatia chloroides*—pink and white varieties; the flowers were very pretty. Other contributions to this department were made by James W. Clark, E. W. Mitchell, Master Hugh Tallant and H. A. Young.

Hollyhocks were exhibited by H. Grundel and A. McLaren. The spikes were the best of this popular flower that have been shown for several years, and the variety was excellent. John B. Moore also exhibited at several of the weekly exhibitions, very large fine spikes of flowers, and dishes of flowers.

Stocks.—The only collection on exhibition was from James Comley.

Late Phloxes.—Unusually good collections were shown by Francis Parkman and John B. Moore. On a visit to the grounds of Mr. Parkman, we saw some three thousand seedlings in bloom, which with their great variety of color presented a truly magnificent appearance, many of them surpassing the imported varieties growing in a bed near by. These seedlings were of fine form and substance, and quite distinct in color, giving every shade of pink, red, and rose, while quite a number had beautiful distinct eyes. Our

attention was also called to a bed of dwarf varieties not over fifteen inches high, which Mr. Parkman hopes by further experiments to reduce to even less height. We hope he may be successful, as there can be nothing finer than an edging of these beautiful flowers for a herbaceous border. Later in the season we visited the garden of John B. Moore, who has a superb collection of named varieties. No more satisfactory plants can be placed in our gardens; give them a rich, moist soil, and they will soon reward the efforts of the grower with large, handsome clumps of rich flowers.

Petunias.—Several collections were placed upon exhibition, the best were those from Mrs. A. D. Wood and W. G. McTear, each collection containing fine flowers of self-colored and striped varieties.

Gladioli.—The principal exhibitors were J. S. Richards, George Craft, Herbert Gleason, A. McLaren, and J. B. Moore. Gladioli have been a very attractive feature of the exhibitions. In addition to the named varieties and the general displays which have been shown, various contributors have from time to time shown very good seedlings, but although many of them were very fine and worthy of cultivation, there were none which in the judgment of your Committee possessed qualifications so superior to the many well-known standard varieties as to warrant a special award. The number of varieties is simply legion, and they have been brought to such a high standard of perfection that it would be very difficult to improve on what we already have.

Native Ferns.—On the 20th of June, George E. Davenport exhibited a collection of forty species and six varieties of hardy native ferns, grown outside, in his garden. Of this collection, *Adiantum Capillus-Veneris*, L., is deserving of special mention on account of its having survived a long winter so far north, with no other protection than a slight covering of brush and in a southern exposure. The collection included, also, *Asplenium Filix-fœmina*, var. *laciniata*, Moore (an English variety discovered in New Jersey in 1875), and *Woodsia glabella*, R. Br., from Vermont, of both which it is believed that cultivated specimens have never been exhibited before.

August 4th, E. H. Hitchings showed an interesting collection of thirty-four species and varieties of ferns, collected in the towns of Chelsea, Stoneham, Melrose, Malden, Hyde Park, Milton, Ded-

ham, and Canton. These were, with but two or three exceptions, whole plants, showing the manner of growth.

August 11th, being prize day, two good collections were shown by Mrs. C. N. S. Horner and F. W. Morandi. George E. Davenport also presented, for exhibition only, a large collection, of which the following had never before been exhibited: *Aspidium argutum*, Kaulf., from California; *Woodsia hyperborea*, R. Br., from Vermont, and *Botrychium simplex*, Hitch., from New York State.

On the 1st of September Mr. Hitchings exhibited a collection of nine different forms of *Botrychium ternatum*, and again on the 10th of November, a collection of eighteen plants, in various forms, which was the greatest variety of this species we have seen in the same number of plants.

Asters.—Excellent stands were shown by C. M. Atkinson, E. Shepherd, Parker Barnes, J. S. Richards, John Parker, Mrs. E. M. Gill, John B. Moore, and A. McLaren. Asters are among our most useful garden plants, and from the ease with which they are cultivated, have become great favorites.

Verbenas.—The show was excellent; there were several contributors, of whom the successful ones were J. B. Moore and A. McLaren. It is gratifying to see that this once most popular of all bedding plants is receiving so much attention, and is exhibited in such goodly varieties.

Double Zinnias.—There was more than usual competition for the prizes offered for this popular annual. Large and very handsome flowers were shown by J. B. Moore, George Craft, James Nugent, W. G. McTear, W. K. Wood, and Mrs. E. M. Gill.

Greenhouse Plants.—The best six in bloom exhibited in April, were by C. M. Atkinson and were fine healthy specimens of *Azaleas*, *Kennedyas*, etc.

At the Annual Exhibition the competitors for the best twelve Greenhouse and Stove Plants were H. H. Hunnewell, Hovey & Co., W. Gray, Jr., and W. C. Strong. The collection from Mr. Hunnewell was of unusual excellence, each plant being a superb specimen. The species were as follows:

Alocasia macrorhiza variegata.—One of the most striking and effective ornamental leaved plants ever introduced, and the very best specimen ever shown.

A. metallica.—Another highly ornamental plant.

Bromelia sceptrum.

Croton Johannis.

C. Youngii.—A robust growing plant of very beautiful form.

C. Weismanni.—One of the best and most ornamental of the genus.

Dieffenbachia Bausei.—One of the finest hybrids of this very ornamental genus.

Eurya latifolia var.

Ficus Parcelli.—A very pretty variegated leaved plant, of free growth.

Hydrangea speciosa.

Maranta Van-den-Heckei.—A very distinct and handsome growing species from Brazil.

Martenezia Lindeniana.—A very handsome plant of this exceedingly ornamental species of American Palms.

From Hovey & Co., the following species:

Alocasia macrorhiza var.

Aralia pulchra.

Camellia Sasanqua var.

Cyanophyllum magnificum.

Dion Edule.—A splendid plant well worthy a place in every collection of ornamental leaved plants.

Dasylirion glauca.

Latania rubra.—One of the finest species of the genus.

Pandanus elegantissimus.—An elegant plant well adapted for decorative purposes.

P. ornatus.—A noble growing species from the Philippines.

Phormium Veitchii.—A fine species of this ornamental genus of plants.

Seaforthia elegans.—A very useful plant, of the highest decorative character.

Thrinax parviflora.—The leaves of this plant are of great beauty, and it is well adapted for decorative purposes.

Although H. H. Hunnewell and Hovey & Co. were the successful competitors, Wm. Gray, Jr. and W. C. Strong exhibited good collections; in each were many rare and choice plants.

Specimen Plants were exhibited by H. H. Hunnewell and Hovey & Co. From Mr. Hunnewell came a magnificent specimen plant of *Musa superba.* It is the first time it has been exhibited, and we append the following description taken from "Williams' Stove and Greenhouse Plants:" "A very distinct and handsome plant,

but requiring strong heat and a moist atmosphere to develop its beauties. In a young state it is not very different in appearance from *M. sapientum* and its varieties, but as its leaves increase in size, the stem becomes swollen towards the base, and the whole plant assumes more the appearance of a grand compact form of *M. ensete*, though from this plant it is abundantly distinct. *M. superba* is a somewhat rare and magnificent plant, but from its size only suitable for those possessing ample room and a large collection."

The specimen presented by Hovey & Co. was *Cycas revoluta*, an old plant, popularly, but, Mr. Williams says, erroneously, called the Sago Palm, since it has nothing to do with the Palms. Mr. W. further says, " as a window plant when young, and for the decoration of hall and corridors when large, it is surpassed by none and equalled by few. In Saxony its leaves are extensively used at funerals as emblems of immortality."

Specimen Flowering Plant.—The successful competitor was J. B. Moore, who brought a good plant of the beautiful *Lapageria alba.*

Variegated Leaved Plants.—For this prize, Hovey & Co., exhibited the following varieties : *Alocasia macrohiza var.*, *Ananassa sativa var.*, *Eurya latifolia var.*, *Agave medio-picta*, *Bambusa Fortunei var.*, and *Yucca aloifolia var.*

From W. C. Strong we had *Eulalia Japonica var.*, *Croton pictum*, *C. angustifolium*, *Pandanus Javanicus*, *Dracœna amabilis*, and *Agave medio-picta.* The plants in these collections were small but well grown.

For the prize for the best single specimen not offered in any collection, H. H. Hunnewell sent a splendid specimen of *Anthurium crystallinum*, and Hovey & Co. a good plant of *Phormium Colensoi var.*

Caladiums.—There were several competitors for this prize and all the collections were made up of good varieties ; C. M. Atkinson and Hovey & Co. were the successful competitors. There were also some new ones from W. T. Andrews, but though they were all good, there did not appear to be distinction enough between them and the many well known varieties now in cultivation to require any special note.

Ferns.—Nine named varieties were shown by J. Warren Merrill, as follows :

Alsophila australis, a very beautiful species of rapid growth.

Cibotium Barometz.

C. princeps, a noble fern requiring plenty of room.

Dicksonia antarctica, a very beautiful species with a stout stem and large spreading fronds; well known as one of the most useful of its class.

Gleichenia circinata glauca.—From New Zealand, and worthy a place in every collection of ferns, being one of the most robust and beautiful of the group to which it belongs.

G. dicarpa.—One of the most elegant of the genus; it is said to be a good grower and one of the best of the section to which it belongs.

Oleandra nodosa.

Platycerium grande. One of the most singular of all ferns. It is an epiphytal evergreen stove species; a native of New Holland and the Malayan Islands.

Polypodium muscæfolium.

Hovey & Co. exhibited the following species:

Adiantum cuneatum, an old fern but indispensable in every collection, and will do well in a moderate temperature; splendid for bouquets.

A. macrophyllum.

Alsophila Van Gheerti.

Asplenium Fabianum.

Davallia Mooreana. This is one of the most beautiful of ferns, the fronds are extremely handsome and gracefully arched.

D. Tyermanni.

Gymnogramme Tartarea, an ornamental, evergreen, stove species.

Leucostegia immersa.

Six new varieties were shown by J. Warren Merrill, as follows: *Davallia Boryana*, *Lomaria fluviatilis*, *Lygodium Fosteri*, *Aglamorpha Meyeniana*, *Adiantum cristatum*, *Asplenium longissimum.*

Adiantums.—J. Warren Merrill and Hovey & Co., were the exhibitors. From Mr. Merrill came the following varieties:

Adiantum Farleyense.—Very properly called the grandest of the *Adiantums.* It derives its name from the place of its origin, Farley Hill, Barbadoes, West Indies.

A. gracillimum (Mist Adiantum).—The most graceful and elegant mist-like form yet introduced. As the plant becomes stronger it is very elegant.

A. Hendersoni.—A distinct plant of robust habit, which when well grown presents a very graceful appearance.

A. princeps.—A free growing plant, with very gracefully arched fronds, and of great value for exhibition or decorative purposes.

A. prionophyllum.

A. rubellum.—A very pretty fern, which should be in every collection, and if grouped with other delicate ferns will be a pleasing addition.

Hovey & Co.'s collection comprised

A. amabile.—This is one of the most lovely of the Maiden-hairs, and cannot fail to become a favorite in all choice collections.

A. concinnum.—A very graceful, pendulous, evergreen, stove species, from the West Indies.

A. concinnum latum.—A new variety of *A. concinnum*, but of stronger growth, making a fine plant for decorative purposes.

A. decorum.—A lovely fern; said to be of very easy growth.

A. excisum multifidum.

A. Farleyense.

Tree Ferns.—Two very fine plants of *Alsophila australis* were shown by W. C. Strong. It is one of the noblest of the tree ferns.

Single Specimens Tree Ferns were shown by J. Warren Merrill and W. C. Strong. Mr. Merrill brought a fine plant of *Cibotium Schiedei*, a very elegant species, with large, spreading, pale green fronds, which, if placed in a prominent position, presents a very imposing appearance. It may be grown in a cool house. Mr. Strong brought a good plant of *Balantium antarcticum* (*Dicksonia antarctica*).

Mr. Merrill also exhibited at the Annual Show, a great variety of ferns cultivated by him, a list of which he has furnished the Committee, as follows:

Exotic Ferns.

Cionidium Moorei (new).
Leucostegia immersa (new).
Davallia elata (new).
" *clavata.*
" *aculeata.*
Adiantum tetraphyllum.
Cheilanthes elegans.
" *lendigera* (new).
Woodwardia radicans cristata (new).
Sadleria squarrosa (new).
Diplazium plantagineum (new).
" *Zeylanicum.*
Pleopeltis stigmatica (new).
Gymnogramme Peruviana.
" *Wettenhalliana.*
" *chrysophylla*, var. *Parsonsii* (new).
Dictyogramme Japonica.
" " *variegata.*

Native Ferns.

Acrostichum aureum (rare).
Polypodium Plumula, H. B. K.
" *intermedium.*
" *incanum* (rare).
" *Scouleri* (rare).
" *Californicum.*
" *Phyllitidis.*
" *aureum.*
" *alpestris* (new and very rare).
Gymnogramme triangularis.
Notholœna ferruginea (new and very rare).
Notholœna dealbata (new and very rare).
Notholœna Newberryi.
Cheilanthes Californica.
" *Alabamensis.*
" *microphylla.*
" *Fendleri.*
" *vestita.*
" *gracillima* (new and very rare).
" *Eatoni.*
" *languginosa.*
" *myriophyllum.*
" *viscosa.*
Pellœa Bridgesii.
" *atropurpurea.*
" *ornithopus.*
" *flexuosa.*
" *densa.*
Pteris longifolia.
" *Cretica.*
" *aquilina*, var. *caudata.*
Adiantum Capillus-Veneris.
Vittaria lineata.
Blechnum serrulatum.
" *Spicant.*
Woodwardia radicans.
" *Virginica.*
" *areolata.*
Scolopendrium vulgare.
Camptosorus rhizophyllus.
Asplenium pinnatifidum (rare).
" *ebenoides.*
" *Trichomanes.*
" *ebeneum.*
" " var. *parvulum*, Mart et Gal.
" *viride.*
" *dentatum* (rare).
" *septentrionale* (new and rare).
" *myriophyllum.*
" *marinum.*
Aspidium Lonchitis.
" *munitum.*
" *Californicum.*
" *aculeatum.*
" " var. *Braunii.*
" *patens.*
" *fragrans.*
" *cristatum*, var. *Floridanum.*
" *argutum.*
" *unitum.*
Nephrolepis exaltata.
Trichomanes Petersii.
" *radicans.*
Aneimia adiantifolia.
Lygodium palmatum.

In addition to the collection just named, Mr. Merrill has shown at the weekly exhibitions, good plants of the following:

Davallia (*Microlepia?*) *anthriscifolia.*
Lindsaya cultrata.
Cheilanthes viscosa.
Pellæa ternifolia.
Pteris serrulata, var. *Leyi.*
Doodia lunulata.
" *caudata.*
Asplenium attenuatum.
" *monanthemum.*
" *Filix-fœmina*, var. *Victoria.*
Polystichium lepidocaulon (new and rare).
Lastrea sanctum.
Nephrolepis pectinata.
Fadyenia prolifera.
Polypodium Phegopteris.
" *Dryopteris.*
" *calcareum.*
Phegopteris hexagonoptera.
" *polypodioides.*
Niphobolus pertusus.
Goniopteris gracilis.
Gymnogramme triangularis.
Hemionitis palmata.
Acrostichum quercifolium (*Gymnopteris Neitneri*).

Lycopods.—The only collection was from W. C. Strong, who exhibited *Lycopodium delicatissimum*, *L. denticulatum aureum*, *L. involvens*, *L. circinale*, *L. stoloniferum*, and *L. Japonicum paradoxum.*

Dracænas.—Six finer plants have seldom, if ever, been seen on exhibition than those from H. H. Hunnewell. The varieties were

Dracæna amabilis.—A very handsome variety, and perhaps the finest of the light variegated kinds.

D. Chelsoni.—A fine growing species; the leaves are very large and the colors rich, producing a splendid effect.

D. imperialis.—Also a fine growing variety, and well adapted for general decorative purposes.

D. Mooreana, a noble plant of graceful habit; the base of the leaf-stalk and midrib are of a bright reddish color, which in the leaf changes to a glossy bronze.

D. Shepherdii.—A large and splendid growing plant, which well deserves a place in every collection.

D. Youngii.—This superb variety is well adapted for conservatory decoration or exhibition purposes; it is a noble plant, with very bright colors, and becomes more beautiful with age.

The plants from Hovey & Co. were much smaller, but the selection of varieties was very good. They were *D. amabilis*, *D. imperialis*, and *D. Shepherdi*, which have already been described, and the three following:

D. Guilfoylei.—This variety is quite distinct from any other

species. It is a splendid plant for both ornamental and decorative purposes.

D. Hendersoni.—Of graceful and elegant habit; color of the leaves bright green, beautifully marbled, with pink and white stripes.

D. stricta.—This has the habit, general character, and color of *D. ferrea*, but the leaves are beautifully feathered and flaked with brilliant rosy crimson and carmine.

Seedling Dracænas, have been exhibited by F. L. Harris and Edward Butler. Mr. Harris presented one of dwarf habit; leaves very wide in proportion to their length (six inches wide and thirteen inches long), waved and much arched, giving the plant a distinct and unique appearance; margin of leaf and petiole of a rich magenta, inclining to purple, and in the young leaves of an extremely delicate hue; the edging of color of variable and irregular width, but never extending into the body of the leaf. The seed was sown in 1876 and was the result of a cross between *Reginæ* and *Mooreana*. It is a very valuable addition to this highly useful and ornamental genus of plants.

From Edward Butler, gardener to Wellesley College, came six seedling *Dracænas*, as follows:

Wellesleyana (No. 1).—Of vigorous growth and ample foliage, the leaves being full sixteen inches in length, exclusive of the petioles, and six inches wide, oval, pointed, the extremities turned downwards. The color is dark bronzy green, margined more or less widely with deep magenta rose, inclining to crimson, and frequently broadening out irregularly and covering nearly the whole leaf; a narrow margin of color extends down the edge of the petiole to the very base. The under side of the leaf, and especially the petiole, have a glaucous hue. The midrib on the under side is deeply colored throughout. The young leaves are variegated with white, which soon changes to pink, and with maturity becomes of a still deeper color. The plant is about two years old, and five feet high; a cross between *stricta* and *Reginæ*, of excellent habit, holding its lower leaves, and forming a very handsome plant. It is undoubtedly the best of the six seedlings shown by Mr. Butler.

No. 2. In general habit similar to *Wellesleyana*, but a little more compact, the color more striped and blended with the green, and the young leaves of a lighter green.

No. 3 and *No.* 5, are of taller and slenderer growth, and have.

lanceolate foliage; the young leaves of the former are striped with white, while those of the latter are variegated with purplish crimson, even in their youngest stages.

No. 4. The most vigorous of all; leaves seven inches in width, with a very narrow edge of purplish magenta; the midrib and small veins of the same color, and the petiole of a deeper shade; of the type of *Braziliensis*.

No. 6. Of comparatively dwarf habit; lanceolate leaves; edges of leaves and petioles magenta scarlet, often extending irregularly into the body of the leaf.

The last five are the result of the same cross as produced *Wellesleyana*, viz., between *stricta* and *Reginæ*, and while in general appearance and habit they are somewhat like the parent plants, they are more vigorous in growth and a great improvement over them, being fully equal to any of the high priced imported varieties.

It is very gratifying to know that the attention of our practical gardeners has been called to the improvement by cross-fertilization of this highly ornamental and useful genus of plants, and we are glad to know that the labors of Mr. Harris and Mr. Butler have been rewarded by the production of these beautiful hybrids. Other seedlings, which are very fine, will be exhibited from time to time as they are more fully developed.

Palms.—William Gray, Jr., exhibited *Areca lutescens*, a fine palm for table decoration, being small and dwarf; with graceful fronds of pale green color. It is worthy a place in every collection; Mr. Gray also presented *Livistonia rotundifolia*.

From Hovey & Co., came *Pritchardia Pacifica variegata* and *Phoenix reclinata*, the latter a very fine greenhouse palm; a native of South Africa.

Pitcher Plants. — The only collection exhibited was from William Gray, Jr., who showed the well known *Sarracenia purpurea; S. psittacina*, a native of Florida; and *Darlingtonia Californica*, a singular and very interesting plant.

Agaves.—John C. Hovey and Hovey & Co., were the exhibitors, with two good collections. Of late years, Agaves have become very popular for ornamental purposes, and should any of the readers of this report wish for further information in regard to culture and varieties they are referred to an excellent article with descriptions of a large number of varieties, in Williams' "Choice Stove and Greenhouse Plants," second edition, Vol. II., page 71.

The varieties shown by J. C. Hovey were *Agave Americana longifolia variegata*, *A. medio-picta*, *A. applanata*, *A. filifera*, *A. Schidigera*, *A. Verschaffeltii*.

From Hovey & Co. came *Agave Americana medio-picta*, *A. applanata*, *A. Besseriana amœna*, *A. dealbata*, *A. heteracantha cœrulea*, *A. hystrix*.

Cacti.—Two excellent collections were shown by J. C. Hovey, the best containing fifteen new and rare species and varieties not exhibited in 1876, viz: —

Cereus Peruvianus,
Echinocactus cylindricus,
" *gibbosus ferox*,
" *Pfersdorffii*,
Echinocereus cinerascens,
Echinopsis Huotti,
" *Schelhasii*,
Mammillaria gracilis,
Mammillaria Hopferiana,
" *impoxicoma*,
" *nivea cristata*,
Opuntia crassa gigantea,
" *integrifolia*,
" *megacantha*,
" *Rafinesquiana*.

Succulents (other than Agaves and Cacti).—The only exhibitor was John C. Hovey; we note the following new and rare species not exhibited in 1876:

Aloe colubrina,
" *serra*,
Echeveria Scaphylla,
Euphorbia mammillaris,
Gasteria acinacifolia,
" *elongata*,
" *lœtepunctata*,
" *subnigricans*,
Gasteria obtusifolia,
Pachyphytum linguœfolia,
Haworthia expansa,
" *margaritifera*,
" *Reinwarti*,
Rochea perfoliata,
Stapelia erucoides.

Mr. Hovey also exhibited twelve new and rare Agaves, and seventy-seven other succulent plants. A very interesting feature of his exhibits was that they were very neatly and plainly labelled, a duty too often neglected by exhibitors.

New Pot Plant.—H. H. Hunnewell exhibited a magnificent specimen of *Phyllotœnium Lindeni*, of which Mr. Williams in his work on "Stove and Greenhouse Plants," second edition, Vol. II., p. 88, says, "It is a magnificent, and at the same time, the only species at present known. The leaves are large, measuring from nine inches in length, and six inches in breadth; they are broadly

sagittate, with large lobes or ears; the ground color is a light, shining green, the midrib is silvery white, as also are the branching midribs of the lobes, the secondary veins are also striped with the same metallic lustre. The petioles are round, curiously striped with black, and usually from one to two feet in height. It is equally effective as an ornament to the stove or the exhibition table, and should find a place in every collection where ornamental-leaved plants are grown. Native of the forests of New Grenada."

Celosia Pyramidalis.—Specimens were shown by C. M. Atkinson and J. S. Richards, which were quite attractive; the flowers are very ornamental, and are produced in great profusion, in spikes of the most beautiful feathery character.

Dahlias have been shown by Macey Randall, S. G. Stone, Hovey & Co., James Nugent, and J. B. Moore. The different collections have been very good; particularly noticeable were those of Macey Randall and S. G. Stone.

Bouquets.—The contributors to this department were James Nugent, Hovey & Co., Mrs. E. M. Gill, Mrs. S. Joyce, James O'Brien, James Comley, and W. G. McTear. While there have been some good bouquets shown, as a whole they have not been up to the highest standard.

Baskets of Flowers have been shown by Mrs. A. D. Wood, Mrs. S. Joyce, Mrs. E. M. Gill, and Hovey & Co. These names are a sufficient guarantee of the character of the productions, which are always among the principal attractions of the exhibitions.

Table Designs have been shown by Mrs. Wood, Mrs. Joyce, Mrs. Gill, and Hovey & Co., have been arranged in good taste, with choice flowers, and have added much to the attractions of the tables. The effort made last year to create a more spirited competition in table designs, by modifying the General Rules so that persons competing in this class could use flowers not raised by themselves, has proved a complete failure, not one person other than the regular contributors having presented a single design.

Cut Flowers were shown at the Annual Exhibition by J. B. Moore, W. K. Wood, Mrs. Gill, J. O'Brien, W. C. Strong, Hovey & Co., James Nugent, S. G. Stone, W. G. McTear, and John Parker. Several of the stands were very handsomely filled, and were kept through the exhibition; others were not properly attended to each day, which detracted very much from the general effect. We trust that no person will in future engage a stand for cut flowers at

the annual exhibition, unless he intends to keep it in good order by renewal each day. At the weekly exhibitions W. K. Wood, J. B. Moore, Mrs. Gill, and Hovey & Co. have been the principal exhibitors. The stands have been finely arranged with choice flowers, and have added greatly to the appearance of the hall; at no time have the displays at the weekly exhibitions been so well kept up.

Fifty named varieties of Annuals and Perennials.—Hovey & Co., J. B. Moore and C. M. Atkinson have been the contributors, each having shown good collections of named varieties, which have been an instructive feature of the exhibition; but your Committee again repeat, as in the two preceding years, that the competition has not met their expectations.

Rustic Stands.—Two excellent stands, arranged in good taste, with choice plants, were shown by Hovey & Co. and W. J. Vass.

Evergreen Trees and Shrubs.—W. C. Strong exhibited thirty-six varieties of hardy evergreeens, comprising ten varieties of Retinisporas, twelve of Spruces, and eight of Arbor Vitæs, with Junipers, Pines, etc., forming an interesting collection.

Chrysanthemums.—This exhibition occurred on the 10th of November, and was a great success—the best show of this flower ever held by the Society. The value of the Chrysanthemum for fall and winter decoration can hardly be over-estimated; the splendid plants exhibited by H. L. Higginson and C. M. Atkinson, bear ample proof of this. The plants from Mr. Higginson, both bush and standards, were superb specimens, and gave good evidence of the ability of his excellent gardener, Joseph Clark; we have no fear of contradiction when we say that these plants were perfect. Mr. Atkinson is sufficiently well known as a good plantsman to need no further commendation on our part. John B. Moore and James Comley also exhibited plants in pots, and E. Sheppard, B. G. Smith, and James Nugent cut flowers.

New and Rare, or Fine Specimen Plants.—C. M. Atkinson exhibited

Begonia glaucophylla scandens, a very fine, graceful growing variety, with beautiful orange flowers. It is a splendid basket plant.

Imatophyllum miniatum.—A fine specimen plant with seven spikes of flowers.

Rhynchospermum jasminioides.—A very handsomely trained specimen plant, filled with its beautiful white flowers.

Anthurium variegatum.—Very pretty.

Gloxinia Mrs. J. L. Gardner.

Spiræa ariæfolia.

Hydrangea hortensis.—Two very handsomely trained specimen plants; the largest and best exhibited.

Thibaudia pulchra.—A very elegant plant; the flowers are very pretty, and will pay well for good care.

From E. S. Rand, Jr., came a good plant of *Anthurium Scherzerianum*, in fine bloom; also *Hexacentris Mysorensis*, a splendid climbing plant for the stove; if desired for exhibition purposes it may be trained to a trellis in such a manner that its long, pendulous branches will show to the best advantage; for decorative purposes it will be found highly useful. Also, *Thunbergia laurifolia*, another stove climbing plant of great beauty; the flowers are very large, and of a pale blue color, with a yellow throat.

From J. Warren Merrill, *Aphelexis splendens* (See TRANSACTIONS for 1877, Part I., p. 108).

From J. B. Moore, very fine sprays of flowers of *Lapageria rosea.*

From Jackson Dawson, *Salvia carduacea* (new).

From Mrs. E. M. Gill, *Browallia Roezli*, new, and a great acquisition to this useful class of plants; also, Hydrangea Thomas Hogg.

From F. L. Ames, *Croton Disraeli* (Veitch), a distinct and effective plant, furnished with broad, three lobed or halberd shaped leaves of a glossy green, and spotted with golden yellow—one of the most interesting and remarkable of all *Crotons* in cultivation. Also, *Aralia elegantissima.*

From Benj. Grey, *Torenia Fournieri*, new and very pretty.

From Miss S. W. Story, *Eulalia Japonica.*

W. C. Strong presented at the Rose Exhibition a very good collection of plants, among them some very fine specimens of

Aloe nobilis,	*Eucalyptus globulus*,
Alsophila australis,	*Hechtea Ghiesbreghtii*,
Cyathea medullaris,	*Maranta zebrina*,
Dyckia regalis,	*Musa ensete.*

From J. C. Hovey, a good collection of *Iris Kœmpferi.*

From Daniel Duffley, a very fine specimen of *Amaryllis Belladonna*, with twenty-eight spikes of its lovely flowers.

From W. T. Andrews, a fine collection of Begonias, consisting of varieties Rei Fernando Major, Madlle. Henrietta Graux (new, 1877), Berenice (new, 1877), Argentea hirsuta, and Michael

Angelo. These were shown in August, and in September another collection of six varieties was presented. All were nice specimen plants, and the varieties were distinct and good.

From C. W. W. Wellington, very fine specimens of *Liatris pycnostachya.*

From Hovey & Co., came the following:

Allamanda Wardleiana, a very fine acquisition. The lobes of the corolla are broader and rounder and of greater substance than in any other species; the throat is also darker in color, and the outside of the flower is of a reddish shade; it blooms nearly all the year round.

Statice Holfordi.—One of the most beautiful greenhouse plants, producing a succession of large racemes of bright blue and white flowers, which remain in perfection for two or three months.

Imatophyllum miniatum and *I. nobilis*, of easy culture, and when in bloom very effective and beautiful plants.

From John Parker, Pelargonium Peter Grieve; this plant was grown in a window, and showed that it had received good care; it was one of the best window plants we have seen.

From L. H. Foster, a fine specimen plant of *Erica densa.*

From W. J. Vass, *Poinsettia pulcherrima, fl. pl.* (cut specimens).

From J. W. Blanchard, a good specimen plant of *Rhynchospermum jasminioides.*

From M. H. Merriam, a very fine plant of *Bougainvillea glabra;* without doubt one of the most showy of the genus; every collection will be enriched by a plant of this variety. It is said to be the best for pot culture.

In conclusion particular attention is again called to the Schedule of Prizes for 1878. Although the premiums in some cases have been reduced, they have been kept up as liberally as the appropriation will allow, and it is earnestly hoped that the small reduction made will not be deemed by cultivators a sufficient reason for a decrease of interest in the exhibitions.

As Chairman I wish to tender to the Committee my sincere thanks for their prompt and efficient support for the past season, and for the perfect harmony attending our deliberations.

This report was adopted by the Committee at a meeting held December 1, 1877.

JOHN G. BARKER, Chairman.

PRIZES AND GRATUITIES AWARDED FOR PLANTS AND FLOWERS.

January 6.

Gratuity:—

To James Comley, for *Azalea Indica*, ... $2 00

January 21.

Gratuities:—

To James Comley, for choice Roses, ... 1 00
M. H. Merriam, for Specimen Hybrid Perpetual Rose, 3 00
W. J. Vass, for Cut Flowers, ... 1 00

January 27.

Gratuities:—

To John B. Moore, for Cut Flowers, ... 1 00
Mrs. E. M. Gill, " " " 1 00
Mrs. S. Joyce, " " " 1 00
Mrs. A. D. Wood, " " " 1 00
James Comley, " " " 1 00
W. J. Vass, " " " 1 00

February 3.

Cyclamens.—For the best six in pots, to C. B. Gardiner, 6 00
For the second best, to James O'Brien, . . . 5 00
Table Design.—For the best other than a Basket of Flowers, to Mrs. E. M. Gill, ... 5 00
For the second best, to Mrs. S. Joyce, . . . 4 00

Gratuities:—

To C. M. Atkinson, for *Phaius grandifolius* and *Begonia glaucophylla scandens*, ... 6 00
Mrs. C. N. S. Horner, for Fernery of Native Plants, . 5 00
John B. Moore, " Specimen Azalea, . . 3 00

To C. B. Gardiner, for Cyclamen, ... $3 00
E. A. Hall, " " 2 00
L. H. Foster, " Rose Buds, ... 1 00
James Comley, " Cut Flowers, ... 2 00
John B. Moore, " " " 2 00
W. K. Wood, " " " 2 00
Miss S. W. Story, " " " 2 00
W. J. Vass, " " " 1 00
B. G. Smith, " " " 1 00

FEBRUARY 10.

Gratuities:—

To Mrs. A. D. Wood, for Cut Flowers, . . . 2 00
Mrs. E. M. Gill, for Amaryllis, ... 1 00
Marshall P. Wilder, for Azaleas, ... 3 00

FEBRUARY 17.

Gratuities:—

To J. Warren Merrill, for Cinerarias, ... 6 00
J. B. Moore, for Specimen Azaleas, ... 4 00
" " " choice Cut Roses, ... 2 00
C. M. Atkinson, choice Lilacs, ... 3 00
A. McLaren, for Seedling Amaryllis, . . . 1 00

FEBRUARY 24.

Gratuities:—

To Marshall P. Wilder, for Azaleas, ... 4 00
C. M. Atkinson, for a fine specimen of *Imatophyllum miniatum*, ... 3 00
L. H. Foster, for *Erica densa*, ... 2 00
J. B. Moore, for Azaleas, ... 4 00
" " " fine blooms of Hybrid Perpetual Roses, ... 2 00

MARCH 3.

CAMELLIAS.—For the best display of named varieties, cut flowers, not less than twenty blooms, to Hovey & Co., ... 6 00

ORCHIDS, WINTER BLOOMING.—For the best three varieties, to E. S. Rand, Jr., ... 10 00

Parlor Bouquets.—For the best pair, to Hovey & Co.,	$5 00
Hybrid Perpetual Roses.—For the best six plants in pots, of distinct varieties, to J. B. Moore, . .	12 00
For the second best, to J. B. Moore, . . .	10 00
For the best twelve blooms, not less than six distinct varieties, to J. B. Moore, ...	5 00
For the second best, to J. B. Moore, . . .	4 00
For the third best, to J. B. Moore, ...	3 00
Spring Flowering Bulbs.—For the best collection in pots, the second prize to Hovey & Co., . .	8 00
Hyacinths.—For the best nine in pots, to C. M. Atkinson,	6 00
For the best six in pots, to C. M. Atkinson, . .	4 00
For the second best, " " " . .	3 00
For the best three in pots, " " " . .	3 00
For the second best, to Hovey & Co., . .	2 00
For the best two, in pots, to C. M. Atkinson, . .	2 00
For the best single specimen, to C. M. Atkinson, .	1 00
Narcissus.—For six pots, three bulbs in a pot, the second prize to Hovey & Co., ...	4 00
For three pots, the second prize to Hovey & Co., .	3 00

Gratuities:—

To Marshall P. Wilder, for Azaleas, ...	3 00
Francis Parkman, for Rose Celine Forestier, . .	3 00
C. B. Gardiner, for Cyclamens, ...	10 00
Hovey & Co., for Basket of Camellias, . . .	3 00
E. S. Rand, Jr., for specimen *Anthurium Scherzerianum*, ...	3 00
John Parker, for Pelargonium Peter Grieve, . .	2 00
J. B. Moore, for Collection of Hyacinths, . . .	3 00
Mrs. N. P. Russell, for Hyacinths, ...	2 00
Henry W. Goodwin, " "	2 00
C. M. Atkinson, for Violets in pots, ...	3 00
Mrs. L. P. Weston, for *Tropœolum tricolorum*, . .	2 00
J. B. Moore, for Tea Roses, ...	2 00
" " " Amaryllis, ...	3 00
Mrs. E. M. Gill, for Cut Flowers, ...	1 00
Benj. G. Smith, " " "	1 00
W. J. Vass, " " "	1 00
Mrs. S. Joyce, " " "	1 00
Mrs. A. D. Wood, " " "	3 00

March 10.

Gratuities:—

To E. S. Rand, Jr., for *Hexacentris Mysorensis*,	$1 00
W. J. Vass, for choice Cut Flowers,	2 00
J. B. Moore, for fine plants of Hybrid Perpetual Roses,	8 00
" " " " Cut Roses,	2 00
" " " " Azaleas,	3 00

March 24.

Gratuities:—

To J. Warren Merrill, for *Aphelexis splendens*,	1 00
W. J. Vass, for Cut Flowers and Azaleas,	3 00
Marshall P. Wilder, for Azaleas,	5 00
James Comley, for Roses and Cut Flowers,	2 00

March 30.

Gratuities:—

To James Comley, for choice Tea Roses,	2 00
C. M. Atkinson, for Roses in Pots,	4 00
J. W. Blanchard, for *Rhynchospermum jasminioides*,	2 00
J. B. Moore, for Azaleas,	6 00
Mrs. E. M. Gill, for *Richardia maculata*,	1 00

AZALEA EXHIBITION.

April 7.

Indian Azaleas.—For the best six named varieties, in pots, to Hovey & Co.,	$25 00
For six named varieties in eight-inch pots, the second prize to Hovey & Co.,	10 00
For the best single specimen, to C. M. Atkinson,	10 00
Greenhouse Plants.—For the best six, in bloom, to C. M. Atkinson,	20 00
Polyanthus.—For the best six, in pots, to C. M. Atkinson,	5 00
Basket of Flowers.—For the best arranged, to Mrs. A. D. Wood,	4 00
For the second best, to Hovey & Co.,	3 00

Gratuities: —

To Marshall P. Wilder, for Azaleas, ... $8 00
Hovey & Co., " " 8 00
M. H. Merriam, for a fine specimen plant of *Bougainvillea glabra*, ... 5 00
C. M. Atkinson, for Hybrid Perpetual Roses, in pots, 4 00
" " " Basket of Roses, . . . 2 00
W. J. Vass, " Pot Plants, ... 2 00
B. G. Smith, " Pansies, ... 1 00
George E. Davenport, for *Trillium nivale*, . . 1 00
Miss S. W. Story, " Floral Design, . . . 2 00
Mrs. E. M. Gill, " Basket of Flowers, . . 1 00
James Comley, " choice Cut Flowers, . . 3 00
W. J. Vass, " Cut Flowers . . . 2 00
J. B. Moore, " " " . . . 2 00

April 14.

Gratuities: —

To J. Warren Merrill, for Calceolarias, ... 8 00
James Comley, for Cut Flowers, ... 1 00

April 21.

Gratuities: —

To Hugh Tallant, for Native Flowers, ... 1 00
George E. Davenport, for Native Flowers, . . 1 00

April 28.

Gratuities: —

To John B. Moore, for *Lapageria rosea*, . . . 1 00
James Comley, for choice Roses, ... 2 00

PELARGONIUM EXHIBITION.

May 5.

Pelargoniums.—For the best six named Zonale varieties, to William Gray, 3d, ... 15 00
For six named bronze varieties, the second prize to Hovey & Co., ... 10 00
Calceolarias.—For six varieties, in pots, the second prize to C. M. Atkinson, ... 8 00

Table Design.—For the best, other than a Basket of Flowers, to Hovey & Co.,	$4 00
For the second best, to Mrs. A. D. Wood,	3 00
Tulips.—For the best twenty-five named flowers, to C. M. Atkinson,	5 00

Special Prize, offered by Peter Smith.

For the best Specimen Variegated Zonale Pelargonium, to William Gray, 3d,	6 00

Gratuities:—

To J. Warren Merrill, for choice Ferns,	3 00
Hovey & Co., for Variegated Zonale Pelargoniums,	5 00
" " " Azaleas,	3 00
Miss Fanny Brewer, for *Saxifraga Virginiensis*,	1 00
W. J. Vass, " *Anthurium Scherzerianum*,	1 00
Jackson Dawson, " *Salvia carduacea*,	1 00
George E. Davenport, for Native Plants,	1 00
Miss A. C. Wheeler, " Dish of Flowers,	1 00
Mrs. E. M. Gill, " Basket of Flowers,	1 00

May 12.

Gratuity:—

To George E. Davenport, for choice Native Flowers,	1 00

May 19.

Gratuities:—

To J. B. Moore, for Seedling Gloxinias,	2 00
Mrs. E. M. Gill, for Cut Flowers,	1 00
W. J. Vass, " " "	1 00
Mrs. A. D. Wood, " " "	1 00
Francis Parkman, " collection of Dwarf Iris,	2 00
William Gray, Jr., " *Cypripediums*,	2 00
C. W. Jenks, " *Cpyripedium pubescens*,	1 00
E. S. Rand, Jr., " Native Plants,	1 00

June 2.

Cut Flowers.—For the best display, filling 150 bottles, to W. K. Wood,	6 00
For the second best, to Mrs. E. M. Gill,	5 00
For the third best to J. B. Moore,	4 00

TABLE DESIGN.—For the best, other than a Basket of Flowers, to Mrs. S. Joyce,	$5 00
For the second best, to Mrs. A. D. Wood,	4 00
BOUQUETS.—For the best pair of Parlor Bouquets, to James Comley,	4 00
For Hand Bouquets, the second prize, to Mrs. E. M. Gill,	2 00
HARDY SHRUBS.—For the best display, to Hovey & Co.,	5 00
For the second best, to Miss S. W. Story,	4 00
For the third best to Miss A. C. Kenrick,	3 00
NATIVE PLANTS.—For the best display of named species and varieties, to Mrs. C. N. S. Horner,	5 00
RHODODENDRONS.—For the best twelve named varieties, one truss of each, to H. H. Hunnewell,	10 00

Hunnewell Premiums.

HARDY RHODODENDRONS.—For the best display of named varieties, to C. M. Atkinson,	35 00
HARDY AZALEAS.—For the best display of named varieties, to Hovey & Co.,	20 00
For the second best, to E. Sheppard,	10 00
For the third best to B. G. Smith,	5 00

Gratuities:—

To H. H. Hunnewell,	for	Rhododendrons and Azaleas,	5 00
E. Sheppard,	"	Rhododendrons,	1 00
Marshall P. Wilder,	"	collection of Pæonies,	5 00
J. B. Moore,	"	Gloxinias,	2 00
C. W. Jenks,	"	*Cypripedium acaule*, var. *alba*,	1 00
Mrs. L. P. Weston,	"	Pansies,	1 00
Geo. E. Davenport,	"	Native Plants,	1 00
E. W. Mitchell,	"	" "	1 00
Miss A. C. Wheeler,	"	Dish of Flowers,	1 00
Mrs. S. Joyce,	"	Cut Flowers,	2 00

JUNE 9.

Gratuities:—

To H. H. Hunnewell,	for	Rhododendrons and Azaleas,	5 00
" "	"	new and rare Rhododendrons,	10 00
Francis B. Hayes,	"	Rhododendrons,	1 00
Mrs. Needham,	"	*Acanthus latifolius*,	1 00

To John B. Moore,	for *Cerastium alpinum*, . .	$1 00
James Cartwright,	" *Cattleya crispa*, . . .	1 00
Miss S. A. Bradbury,	" Air Plants, ...	1 00
Byron D. Halsted,	" Fungi, ...	2 00
Mrs. S. Joyce,	" Cut Flowers, . . .	1 00
Mrs. E. M. Gill,	" " " . . .	1 00

JUNE 16.

Gratuities: —

To William Gray, Jr., for a fine stand of Hybrid Perpetual Roses, ...	5 00
W. J. Vass, for Plants, ...	1 00
J. B. Moore, for choice Cut Flowers, . . .	2 00
Mrs. E. M. Gill, for " " . . .	1 00
Mrs. S. Joyce, " " " . . .	1 00

ROSE EXHIBITION.

JUNE 20.

HARDY PERPETUAL ROSES.—For the best six new varieties sent out since 1873, to William Gray, Jr., . .	$25 00
For the best twelve distinct named varieties, to C. M. Atkinson, ...	10 00
For the second best, to Francis Parkman, . .	8 00
For the third best, to C. M. Atkinson, . . .	6 00
For the best six distinct named varieties, to William Gray, Jr., ...	6 00
For the second best, to Francis Parkman, . .	5 00
For the third best, to John B. Moore, . . .	4 00
For the best three named varieties, to William Gray, Jr.,	4 00
For the third best, to John B. Moore, . . .	2 00
MOSS ROSES.—For the best twelve named varieties, to W. H. Spooner, ...	10 00
TENDER ROSES.—For the best twelve named varieties, to James Comley, ...	10 00
For the best twelve Marechal Niel, to M. D. Spalding,	5 00
For the best twelve of any other variety of Tea Rose, to James Comley for Souvenir de Malmaison, .	5 00
GENERAL DISPLAY.—For the best, to J. S. Richards, .	15 00
For the second best, to E. W. Wood, . . .	10 00

Special Prizes for Hybrid Perpetual Roses.

For the best twelve of any one variety, to J. B. Moore,	$25 00
For the best six of any one variety, to J. S. Richards,	15 00
For the best twelve named varieties, to Francis Parkman,	25 00
For the best six named varieties, to J. C. Chaffin,	15 00
Specimen Plant.—For the best specimen plant of a kind for which no special prize is offered, to A. B. Gilbert,	10 00
Native Plants.—For the best display of named species and varieties, to Mrs. C. N. S. Horner,	5 00
Wardian Case.—For the best, to D. R. Beckford, Jr.,	10 00
For the second best, to Hovey & Co.,	8 00
Herbaceous Pæonies.—For ten named varieties, the second prize to A. McLaren,	4 00
Sweet Williams.—For the best thirty trusses, not less than ten distinct varieties, to James Nugent,	5 00
For the second best, to Harry L. Rand,	4 00
Cut Flowers.—For the best display to W. K. Wood,	5 00
For the second best, to Hovey & Co.,	4 00
For the third best, to J. O'Brien,	3 00
Table Design.—For the best, other than a Basket of Flowers, to Mrs. S. Joyce,	4 00
For the second best, to Mrs. E. M. Gill,	3 00
For the third best, to Mrs. A. D. Wood,	2 00
Bouquets.—For the best pair of Parlor Bouquets, to Hovey & Co.,	4 00
For the second best, to James Comley,	3 00
For the best pair of Hand Bouquets to James O'Brien,	4 00
For the second best, to James Nugent,	3 00

Gratuities:—

To William Gray, Jr., for a magnificent stand of Baronne de Rothschild Rose,	15 00
W. H. Spooner, for Roses,	5 00
M. D. Spalding, for Collection of Roses,	3 00
A. McLaren, for Roses,	1 00
Hovey & Co., for Moss Roses,	1 00
W. C. Strong, for Collection of Plants,	20 00
Hovey & Co., " " "	10 00

To F. L. Ames, for choice Plants,	$8 00
C. M. Atkinson, for *Rhynchospermum jasminioides*,	5 00
D. R. Beckford, Jr., for *Broughtonia sanguinea*,	1 00
Miss A. C. Kenrick, for *Magnolia macrophylla*,	1 00
Mrs. J. W. Wolcott, for *Habenaria fimbriata*,	2 00
E. H. Hitchings, for *Hottonia inflata*,	1 00
Hovey & Co., for Richardson's Seedling Pæonies,	2 00
Mrs. S. Joyce, for Gloxinias,	2 00
Miss S. W. Story, for Dianthus,	1 00
James Comley, for Cut Flowers,	4 00
C. M. Atkinson, " " "	2 00
Mrs. E. M. Gill, " " "	3 00
Miss A. C. Kenrick, " " "	1 00
Miss S. W. Story, for Basket of Flowers,	2 00
J. Warren Merrill, for Ferns,	3 00

STRAWBERRY SHOW.

June 27.

Cut Flowers.—For the best display, to W. K. Wood,	$5 00
For the second best, to Hovey & Co.,	4 00
For the third best, to James Nugent,	3 00
Basket of Flowers.—For the best arranged, to Mrs. S. Joyce,	3 00
Parlor Bouquets.—For the best pair, to James O'Brien,	3 00
For the second best, to James Nugent,	2 00

Gratuities:—

To J. S. Richards, for Roses,	5 00
William Gray, 3d, for Hybrid Perpetual Roses,	3 00
Miss S. W. Story, for Table Design,	3 00
Mrs. E. M. Gill, for *Bilbergia*,	1 00
D. R. Beckford, Jr., for *Oncidium*,	1 00
M. W. Clark, for *Myosotis*,	1 00
Miss S. W. Story, for *Dianthus*,	1 00
Harry L. Rand, for Sweet Williams,	2 00
Miss A. C. Wheeler, for Cut Flowers,	1 00
Miss A. C. Kenrick, " " "	1 00
Mrs. L. P. Weston, for Bouquet and Pansies,	2 00
Byron D. Halsted, for *Drosera* and *Utricularia*,	2 00

To Byron D. Halsted, for Collection of named Fungi, .	$5 00
" " " " " " Grasses,	5 00
Mrs. C. N. S. Horner, for Native Flowers, . .	3 00
E. H. Hitchings, " " " . . .	1 00

July 7.

Cut Flowers.—For the best display, to W. K. Wood, .	5 00
For the second best, to Hovey & Co., . . .	4 00
For the third best, to James Nugent, . . .	3 00
Table Design.—For the best, other than a Basket of Flowers, to Mrs. S. Joyce, ...	3 00
For the second best, to James O'Brien, . . .	2 00
Gratuities:—	
To C. M. Atkinson, for Plants, ...	3 00
Mrs. S. A. F. Mead, for *Hoya carnosa*, . . .	2 00
W. G. McTear, for *Eucomis regia*, ...	1 00
Mrs. A. D. Wood, for Balsams, ...	1 00
Harry L. Rand, for Tropæolums, ...	1 00
Francis Putnam, for Seedling Amaryllis, . . .	1 00
C. M. Atkinson, for Carnations and Picotees, . .	1 00
Mrs. E. M. Gill, for Basket of Flowers, . .	2 00
Miss S. W. Story, " " " " . .	2 00
Mrs. A. D. Wood, " " " " . .	2 00
Miss A. C. Wheeler, " " " " . .	1 00
Hovey & Co., for Cut Flowers, ...	2 00
J. B. Moore, " " "	1 00
J. S. Richards, for *Lilium Canadense*, . . .	2 00
James Comley, " " *Philadelphicum*, . .	2 00
E. H. Hitchings, for Native Flowers, . . .	2 00
Mrs. C. N. S. Horner, for Native Plants, . .	2 00
George E. Davenport, " " " . . .	1 00
J. W. Merrill, for Ferns, ...	2 00

July 14.

Cut Flowers.—For the best display, to W. K. Wood, .	5 00
For the second best, to Mrs. E. M. Gill, . .	4 00
For the third best, to Hovey & Co., . . .	3 00
Hand Bouquets.—For the best pair, to W. G. McTear,	3 00
For the second best, to J. O'Brien, . . .	2 00

TABLE DESIGN.—For the best, other than a Basket of Flowers, to Mrs. S. Joyce, ... $3 00
For the second best, to J. O'Brien, ... 2 00
NATIVE PLANTS.—For the best display of named species and varieties, to Mrs. C. N. S. Horner, . . 5 00

Gratuities:—

To W. J. Vass, for Plants, ... 1 00
E. A. Story, for *Justicia carnea*, ... 1 00
" " " Double Lobelia 1 00
James Nugent, for Bouquets of Sweet Peas, . . 1 00
Stiles Frost, " " " " . . 1 00
Harry L. Rand, for Lilies, ... 1 00
Francis Putnam, for Amaryllis, ... 1 00
C. M. Atkinson, " Hollyhocks and Carnations, . 3 00
" " " Seedling Carnations and Picotees, ... 2 00
Macey Randall, for Dahlias, ... 1 00
John B. Moore, " Cut Flowers, ... 2 00
J. S. Richards, " " " 1 00
James Nugent, " " " 2 00
W. J. Vass, " " " 2 00
James Comley, " " " 1 00
Miss A. C. Wheeler, for Dish of Flowers, . . 1 00
Mrs. A. D. Wood, for Table Design, . . . 2 00
George E. Davenport, for Native Flowers, . . 1 00
E. H. Mitchell, " " " . . . 1 00
James Comley, " *Lilium Canadense*, . . 1 00

JULY 21.

HOLLYHOCKS.—For the best twelve spikes, of twelve distinct colors, to Herman Grundel, . . . 10 00
For the second best, to A. McLaren, . . . 8 00
ORCHIDS.—For three varieties in bloom, the second prize to James Cartwright, ... 8 00
CUT FLOWERS.—For the best display, to Hovey & Co., . 5 00
For the second best, to W. K. Wood, . . . 4 00
For the third best, to Mrs. E. M. Gill, . . . 3 00
BASKET OF FLOWERS.—For the best arranged, to Mrs. S. Joyce, ... 3 00

PARLOR BOUQUETS.—For the best pair, the second prize to James Comley, ... $2 00

Gratuities:—

To J. Warren Merrill, for Ferns, ... 3 00
C. M. Atkinson, " *Oncidium Wentworthianum*, 2 00
Francis Putnam, " Seedling Amaryllis, . . 1 00
J. O'Brien, " new Dwarf Candytuft, . 1 00
J. B. Moore, " fine Hollyhocks, . . 3 00
James Nugent, " " . . 2 00
C. M. Atkinson, " " . . 1 00
E. Sheppard, " " . . 1 00
D. R. Beckford, Jr., " Native Flowers, . . . 1 00
E. H. Hitchings, " " " . . . 1 00
Mrs. C. N. S. Horner, " " " . . . 3 00
Miss A. C. Wheeler, " Dish of Flowers, . . . 1 00
J. O'Brien, " Cut Flowers, . . . 2 00
Mrs. L. P. Weston, " " " . . . 1 00
George Craft, " " " . . . 1 00
James Nugent, " " " . . . 1 00
Mrs. A. D. Wood, " " " . . . 1 00
W. J. Vass, " " " . . . 1 00

JULY 28.

CUT FLOWERS.—For the best display, to W. K. Wood, . 5 00
For the second best, to Mrs. E. M. Gill, . . 4 00
For the third best, to Hovey & Co., . . . 3 00
For the best collection of fifty named varieties of Greenhouse Flowers, to Hovey & Co., . . . 6 00
BASKET OF FLOWERS.—For the best arranged, to Hovey & Co., ... 3 00
For the second best, to Mrs. S. Joyce, . . . 2 00
FUNGI.—For the best collection of named varieties, to Byron D. Halsted, ... 4 00

Gratuities:—

To A. McLaren, for Hollyhocks, ... 1 00
" " " Amaryllis, ... 2 00
E. A. Story, " Lilies, ... 1 00

To Mrs. C. N. S. Horner,	for Native Plants, . .	$3 00
George E. Davenport,	" " " . .	2 00
Miss M. E. Carter,	" " " . .	2 00
E. H. Hitchings,	" " " . .	1 00
Byron D. Halsted,	" Weeds and Wild Plants,	2 00
Miss A. C. Wheeler,	" Dish of Flowers, . .	1 00
J. B. Moore,	" Cut Flowers, . .	2 00
George Craft,	" " " . .	2 00
Samuel Hartwell,	" " " . .	2 00
James Nugent,	" " " . .	1 00
James Comley,	" " " . .	1 00
Mrs. L. P. Weston,	" " " . .	1 00

August 4.

Stocks.—For six varieties, one plant of each, the second prize, to James Comley, ...	3 00
Hand Bouquets.—For the best pair, to James Nugent, .	3 00
For the second best, to James O'Brien, . . .	2 00
Cut Flowers.—For the best display, to J. B. Moore, .	5 00
For the second best, to Hovey & Co., . . .	4 00
For the third best, to W. K. Wood, . . .	3 00
For the best collection of fifty named varieties of Annuals and Perennials, to Hovey & Co., . .	6 00
For the second best, to J. B. Moore, . . .	4 00
Table Design.—For the best, other than a Basket of Flowers, to Mrs. S. Joyce, ...	5 00
For the second best, to Hovey & Co., . . .	4 00
Native Flowers.—For the best display of named species and varieties, to George E. Davenport, . .	5 00
For the second best, to Mrs. C. N. S. Horner, .	4 00

Gratuities:—

To James Nugent,	for *Stanhopea tigrina*, . . .	1 00
E. A. Story,	" *Lilium auratum*, . . .	1 00
E. Sheppard	" " " . . .	1 00
J. S. Richards,	" Gladioli, ...	5 00
Francis Parkman,	" Seedling Phlox, . . .	3 00
A. McLaren,	" Hollyhocks, ...	2 00
Macey Randall,	" Dahlias, ...	2 00

To James Comley,	for collection of Roses,	$1 00
George Craft,	" Cut Flowers,	3 00
W. J. Vass,	" " "	2 00
James Comley,	" " "	1 00
Mrs. C. B. Chase,	" " "	1 00
James Nugent,	" " "	1 00
Mrs. L. P. Weston,	for Cut Flowers,	1 00
E. Sheppard,	" " "	1 00
Miss A. C. Wheeler,	" Dish of Flowers,	1 00
Byron D. Halsted,	" New England Algæ,	8 00
" "	" Native Ferns and Flowers,	3 00
E. H. Hitchings,	" collection of Native Ferns,	8 00
" "	" Native Flowers,	1 00
Eddie W. Mitchell,	" " "	2 00

AUGUST 11.

LATE PHLOXES.—For the best ten distinct named varieties, to Francis Parkman,	4 00
For the second best, to J. B. Moore,	3 00
PETUNIAS.—For the best collection of double and single varieties, to Mrs. A. D. Wood,	4 00
For the second best, to W. G. McTear,	3 00
CUT FLOWERS.—For the best display, to J. B. Moore,	5 00
For the second best, to Mrs. E. M. Gill,	4 00
For the third best, to Hovey & Co.,	3 00
BASKET OF FLOWERS.—For the best arranged, to Hovey & Co.,	3 00
For the second best, to Mrs. S. Joyce,	2 00
NATIVE FERNS.—For the best display of named species, not cultivated, to Mrs. C. N. S. Horner,	5 00
For the second best, to F. W. Morandi,	4 00

Gratuities: —

To C. M. Atkinson,	for Specimen Hydrangeas,	10 00
J. S. Richards,	" Gladioli,	8 00
Francis Parkman,	" Seedling Phlox,	3 00
W. T. Andrews,	" Begonias,	3 00
Macey Randall,	" Dahlias,	2 00
E. A. Story,	" Lilies,	1 00
A. McLaren,	" Hollyhocks,	1 00

To James Comley,	for	Roses, ...	$1 00
Mrs. S. Joyce,	"	Pomegranate Flowers, . .	1 00
C. M. Atkinson,	"	*Lilium lancifolium*, . .	4 00
Daniel Duffley,	"	*Amaryllis Belladonna*, . .	3 00
C. W. W. Wellington,	for	*Liatris pycnostachya*, .	2 00
Hovey & Co.,	"	*Peristeria elata*, . .	1 00
M. H. Merriam,	"	Cut Flowers, . .	2 00
George Craft,	"	" " . .	2 00
James Nugent,	"	" " . .	1 00
Mrs. A. D. Wood,	"	Basket of Flowers, .	2 00
Mrs. C. B. Chase,	"	" " .	1 00
Miss A. C. Wheeler,	"	Dish of " .	1 00
Byron D. Halsted,	"	Native " .	3 00
" "	"	" Plants in Fruit, .	2 00
George E. Davenport,	"	" Flowers, . .	3 00
" "	"	" Ferns, . .	3 00
E. H. Hitchings,	"	" Flowers, . .	2 00
Mrs. H. D. Wilmarth,	"	" " . .	2 00

August 18.

Gladioli.—For the best twenty named varieties, in spikes, to J. S. Richards, ...	10 00
For the second best, to George Craft, . . .	8 00
For the best ten named varieties, to J. S. Richards, .	6 00
For the second best, to George Craft, . . .	5 00
For the best display of named or unnamed varieties, to J. S. Richards, ...	10 00
For the second best, to George Craft, . . .	8 00
For the third best, to Herbert Gleason, . . .	6 00
Parlor Bouquets.—For the best pair, the second prize to James Comley, ...	2 00
Hand Bouquets.—For the best pair, to J. O'Brien, .	3 00
For the second best, to Mrs. E. M. Gill, . . .	2 00
Cut Flowers.—For the best display, to J. B. Moore, .	5 00
For the second best, to Mrs. E. M. Gill, . .	4 00
For the third best, to W. K. Wood, . . .	3 00
For the best collection of fifty named varieties of Annuals and Perennials, to Hovey & Co., . . .	6 00
For the second best, to C. M. Atkinson, . .	4 00

TABLE DESIGN.—For the best, other than a Basket of Flowers, to Mrs. S. Joyce,	$3 00
For the second best, to Hovey & Co.,	2 00
Gratuities:—	
To E. A. Story, for Lilies and Gladioli,	2 00
M. H. Merriam, for Gladioli,	1 00
A. McLaren, " "	1 00
" " " Hollyhocks,	2 00
F. Webster, for Petunias,	2 00
Macey Randall, for Dahlias,	3 00
E. Sheppard, for Lilies,	1 00
Hovey & Co., " *Rhexia Virginica*,	1 00
" " " *Bignonia grandiflora*,	1 00
C. M. Atkinson, for *Thibaudia pulchra*,	2 00
" " " *Lilium auratum*,	1 00
J. Warren Merrill, for choice Ferns,	3 00
James Nugent, for Cut Flowers,	1 00
D. R. Beckford, Jr., for Dish of Flowers,	2 00
Mrs. C. B. Chase, " " "	2 00
Miss A. C. Wheeler, for Basket of Flowers,	1 00
George E. Davenport, for Native Plants,	2 00
Byron D. Halsted, for Native Plants,	2 00
E. H. Hitchings, " " Ferns,	1 00

AUGUST 25.

ASTERS.—For the best thirty flowers, not less than ten varieties, to C. M. Atkinson,	5 00
For the second best, to E. Sheppard,	4 00
For the third best, to Parker Barnes,	3 00
For the best fifteen flowers, not less than six varieties, to J. S. Richards,	3 00
For the second best, to John Parker,	2 00
For the third best, to Mrs. E. M. Gill,	1 00
POMPONS.—For the best sixty blooms, not less than six varieties to Parker Barnes,	4 00
For the second best, to J. B. Moore,	3 00
For the third best, to A. McLaren,	2 00
CUT FLOWERS.—For the best display, to E. W. Wood,	5 00
For the second best, to Mrs. E. M. Gill,	4 00
For the third best, to Hovey & Co.,	3 00

Basket of Flowers.—For the best arranged, to Mrs. S. Joyce,	$3 00
For the second best, to Hovey & Co.,	2 00
Gratuities:—	
To George Craft, for Gladioli,	8 00
J. S. Richards, " "	6 00
M. H. Merriam, " "	2 00
A. McLaren, for Hollyhocks and Gladioli,	2 00
Macey Randall, for Dahlias,	3 00
Hovey & Co., " "	1 00
E. Sheppard, " " and Asters,	1 00
Harry L. Rand, for Tropæoleums,	1 00
E. Sheppard, for *Lilium auratum*,	1 00
C. W. W. Wellington, for *Liatris sphœroidea*,	1 00
James Comley, for Plants and Flowers,	1 00
E. A. Story, for Cut Flowers,	2 00
W. J. Vass, " " "	2 00
J. B. Moore, " " "	3 00
F. B. Hayes, " " "	1 00
James Nugent, " " "	1 00
D. R. Beckford, Jr., for Dish of Flowers,	1 00
Miss A. C. Wheeler, " " " "	1 00
George E. Davenport, for Native Plants,	2 00
H. A. Young, " " "	2 00
Mrs. C. N. S. Horner, " " Flowers,	2 00
" " " " " " Ferns,	1 00

September 1.

Verbenas.—For the best collection, to J. B. Moore,	4 00
For the second best, to A. McLaren,	3 00
Cut Flowers.—For the best display, to J. B. Moore,	5 00
For the second best, to W. K. Wood,	4 00
For the third best, to Mrs. E. M. Gill,	3 00
For the best collection of fifty named varieties of Annuals and Perennials, to C. M. Atkinson,	6 00
For the second best, to Hovey & Co.,	4 00
Basket of Flowers.—For the best arranged, to Mrs. A. D. Wood,	3 00
For the second best, to Hovey & Co.,	4 00

NATIVE PLANTS.—For the best display of named species and varieties, to Mrs. C. N. S. Horner, . . $5 00
For the second best, to Byron D. Halsted, . . 4 00

Gratuities:—

To W. T. Andrews, for Begonias, ... 5 00
George Craft, for Gladioli, ... 5 00
Macey Randall, for Dahlias, ... 4 00
Hovey & Co., " " 1 00
S. G. Stone, " " 1 00
A. McLaren, for Hollyhocks, ... 1 00
Hovey & Co., " Pot Plants, ... 2 00
" " " *Vallota purpurea*, ... 2 00
Daniel Duffley, for *Nerine coruscans*, . . . 2 00
James Nugent, for Cut Flowers, ... 1 00
S. G. Stone, " " " 1 00
Miss A. C. Wheeler, for Dish of Flowers, . . 1 00
D. R. Beckford, " " " " . . . 1 00
Mrs. C. B. Chase, " " " " . . . 1 00
E. H. Hitchings, for *Botrychiums*, ... 3 00
George E. Davenport, for Native Plants, . . . 2 00
Eddie W. Mitchell, for Native Flowers, . . . 1 00

SEPTEMBER 8.

DOUBLE ZINNIAS.—For the best twenty flowers, six varieties, to J. B. Moore, ... 4 00
For the second best, to W. G. McTear, . . . 3 00
For the third best, to George Craft, . . . 2 00
For the best ten flowers, four varieties, to James Nugent, 3 00
For the second best, to George Craft, . . . 2 00
For the third best, to Mrs. W. Latham, . . . 1 00
CUT FLOWERS.—For the best display, to W. K. Wood, . 5 00
For the second best, to J. B. Moore, . . . 4 00
For the third best, to Mrs. E. M. Gill, . . . 3 00
BASKET OF FLOWERS.—For the best arranged, to Mrs. A. D. Wood, ... 3 00
TABLE DESIGN.—For the best, other than a Basket of Flowers, to Hovey & Co., ... 5 00
For the second best, to Mrs. E. M. Gill, . . 4 00

Gratuities:—

To J. S. Richards, for Gladioli,	$6 00
George Craft, " "	5 00
W. T. Andrews, " Begonias,	5 00
Hovey & Co., " Dahlias,	2 00
James Comley, " *Echinocactus cylindricus*,	2 00
J. Warren Merrill, for Ferns,	2 00
Miss A. C. Wheeler, for a Dish of Flowers,	1 00
Miss S. W. Story, " " " "	1 00
Hovey & Co., " " " "	1 00
James Nugent, for Cut Flowers,	1 00
Miss M. E. Carter, for Native Plants,	5 00
Mrs. C. N. S. Horner, " " "	2 00
Byron D. Halsted, for Grasses and Sedges,	5 00
" " " Native Flowers,	2 00

ANNUAL EXHIBITION.

SEPTEMBER 18, 19, 20, AND 21.

GREENHOUSE PLANTS.—For the best twelve greenhouse and stove plants, of different varieties, to H. H. Hunnewell,	$35 00
For the second best, to Hovey & Co.,	30 00
SPECIMEN PLANT.—For the best, not variegated, of a kind for which no special prize is offered, to H. H. Hunnewell,	10 00
For the second best, to Hovey & Co.,	6 00
SPECIMEN FLOWERING PLANT.—For the best, to J. B. Moore,	10 00
VARIEGATED LEAVED PLANTS.—For the best six varieties not offered in the collection of greenhouse plants, to Hovey & Co.,	15 00
For the second best, to W. C. Strong,	10 00
For the best single specimen, not offered in any collection, to H. H. Hunnewell,	5 00
For the second best, to Hovey & Co.,	4 00
CALADIUMS.—For the best six varieties, to C. M. Atkinson,	6 00
For the second best, to Hovey & Co.,	5 00

FERNS.—For the best nine named varieties, to J. Warren Merrill, ... $15 00
For the second best, to Hovey & Co., . . . 10 00
For the best six new varieties, to J. Warren Merrill, . 10 00
ADIANTUMS.—For the best six varieties, to J. Warren Merrill, ... 10 00
For the second best, to Hovey & Co., . . . 8 00
TREE FERNS.—For the best two, to W. C. Strong, . . 15 00
For the best single specimen, to J. Warren Merrill, . 6 00
For the second best, to W. C. Strong, . . . 5 00
LYCOPODS.—For the best six named varieties, to W. C. Strong, ... 5 00
DRACÆNAS.—For the best six named varieties, to H. H. Hunnewell, ... 10 00
For the second best, to Hovey & Co., . . . 6 00
PALMS.—For the best pair, to William Gray, Jr., . . 10 00
For the second best, to Hovey & Co., . . . 6 00
PITCHER PLANTS.—For the best three, to William Gray, Jr., ... 8 00
AGAVES.—For the best six distinct varieties, to J. C. Hovey, ... 15 00
For the second best, to Hovey & Co., . . . 10 00
CACTI.—For the best twenty-five species and varieties, to J. C. Hovey, ... 10 00
For the second best, to J. C. Hovey, . . . 8 00
SUCCULENTS.—For the best collection (other than Agaves and Cacti), of twenty-five species and varieties, to J. C. Hovey, ... 15 00
For the second best, to Hovey & Co., . . . 10 00
BEST NEW POT PLANT.—It having never before been shown at any exhibition of the Society, to H. H. Hunnewell, the Society's Silver Medal.
CELOSIA PYRAMIDALIS.—For the best four, to C. M. Atkinson, ... 5 00
For the best three, to J. S. Richards, . . . 4 00
GLADIOLI.—For the best display and best kept during the exhibition, of named or unnamed varieties, filling two hundred bottles, to J. S. Richards, . . 10 00
For the second best, to George Craft, . . . 8 00
For the third best, to H. Gleason, ... 6 00

Dahlias.—For the best twelve named varieties, to S. G. Stone,	$6 00
For the second best, to Macey Randall,	5 00
For the third best, to Hovey & Co.,	4 00
For the best six named varieties, to James Nugent,	4 00
For the second best, to Hovey & Co.,	3 00
For the best single flower, to S. G. Stone,	2 00
For the best general display, filling 100 bottles, to Macey Randall,	8 00
For the second best, to S. G. Stone,	6 00
For the third best, to Hovey & Co.,	4 00
Liliputian Dahlias.—For the best general display, filling 50 bottles, to Macey Randall,	4 00
For the second best, to S. G. Stone,	3 00
Parlor Bouquets.—For the best pair exhibited on Wednesday, to James Nugent,	6 00
For the second best, to Hovey & Co.,	4 00
For the best pair on Thursday, to James Nugent,	6 00
For the second best, to Hovey & Co.,	4 00
Hand Bouquets.—For the best pair exhibited on Wednesday, to Mrs. E. M. Gill,	6 00
For second best, to Mrs. S. Joyce,	4 00
For the best pair on Thursday to Mrs. S. Joyce,	6 00
For the second best, to James Nugent,	4 00
Cut Flowers.—For the best display and best kept during the exhibition, filling 100 bottles, to J. B. Moore,	18 00
For the second best, to W. K. Wood,	16 00
For the third best, to Mrs. E. M. Gill,	14 00
For the fourth best, to James O'Brien,	12 00
For the fifth best, to W. C. Strong,	10 00
For the sixth best, to Hovey & Co.,	8 00
For the seventh best, to James Nugent,	6 00
Basket of Flowers.—For the best arranged and best kept through the exhibition, to Hovey & Co.,	6 00
For the second best, to Mrs. S. Joyce,	5 00
Rustic Stand.—For the best specimen, not less than three feet in height, to be planted with choice plants, to Hovey & Co.,	10 00
For the second best, to W. J. Vass,	8 00

TABLE DESIGN.—For the best, and best kept during the exhibition, to be arranged without fruit, and not to exceed four feet in height, to Mrs. E. M. Gill . $10 00
For the second best, to Mrs. A. D. Wood, . . 8 00

Hunnewell Premiums.

EVERGREEN TREES AND SHRUBS.—For the best display, in pots, to W. C. Strong, ... 8 00

Gratuities:—

To C. M. Atkinson, for *Eurya latifolia variegata*, . . 5 00
J. B. Moore, " *Maranta Makoyana*, . . 2 00
Wm. Gray, 3d, " *Caladium argyrites*, . . . 2 00
Hovey & Co., " *Hymenodium crinitum*, . . 2 00
" " " *Roezlia glauca*, . . . 5 00
" " " *Bonapartea juncea*, . . . 2 00
" " " *Phœnix reclinata*, . . . 3 00
James Comley, " *Amaryllis Josephine*, . . 2 00
D. R. Beckford, Jr., for *Ionopsis paniculata*, . . 1 00
James Comley, " *Nymphœa Devoniensis*, . 3 00
G. F. Fessenden, " *Abutilon* sp., . . . 1 00
W. J. Vass, " collection of Plants, . . 10 00
Hovey & Co., " " Ivies, . . 10 00
" " " " Coleus, . . 4 00
Byron D. Halsted, " Insectivorous Plants, . . 3 00
James Comley, " Plants, ... 2 00
J. C. Hovey, " new and rare Succulents, . 10 00
" " " new Agaves, . . . 5 00
F. W. Andrews, " Caladiums, . . . 5 00
W. C. Strong, " Begonias, ... 4 00
J. B. Moore, " Zinnias, ... 2 00
E. Sheppard, " Gladioli, ... 2 00
J. Warren Merrill, " rare Exotic Ferns, . . 8 00
" " " choice Native Ferns, . . 10 00
B. D. Halsted, " Fungi, ... 5 00
Mrs. C. N. S. Horner, " Native Plants, . . . 2 00
James Comley, " Basket of Roses, . . 2 00
Mrs. S. Joyce, " Old Style Basket, . . 1 00
Carl Deeterich, " Wardian Case, . . 3 00
W. H. Halliday, " Fern " . . 3 00
" " " Hanging Fern Case, . . 2 00

SEPTEMBER 29.

Gratuity:—

To S. G. Stone, for Dahlias, ... $5 00

OCTOBER 6.

TABLE DESIGN.—For the best, other than a Basket of Flowers, to Mrs. S. Joyce, ... 3 00
For the second best, to Mrs. E. M. Gill, . . 2 00
PARLOR BOUQUETS.—For the best pair, to James O'Brien, 4 00
For the second best, to James Nugent, . . . 3 00
HAND BOUQUETS.—For the best pair, to James Nugent, 3 00
For the second best, to James O'Brien, . . . 2 00

Gratuities:—

To Macey Randall for Dahlias, ... 3 00
S. G. Stone, " " 3 00
Hovey & Co., " " 1 00
J. C. Park, " Cockscombs, ... 3 00
B. G. Smith, " Dahlias and Cockscombs, . . 2 00
James Cartwright, for *Odontoglossum grande*, . 2 00
D. R. Beckford, Jr., " *Allamandas*, . . . 1 00
James Comley, " Pot Plants, . . . 1 00
" " " Bouquet of Roses, . . 1 00
J. B. Moore, " Cut Flowers, . . . 2 00
Mrs. A. D. Wood, " Basket of Flowers, . . 2 00
Mrs. C. N. S. Horner, " Native Plants, . . . 2 00
" " " " Fernery, ... 1 00

OCTOBER 27.

Gratuities:—

To S. G. Stone, for Dahlias, ... 2 00
James Comley, " Cut Flowers, ... 1 00
W. J. Vass, " " " 1 00

NOVEMBER 3.

To Hovey & Co., for Plants, ... 3 00
W. J. Vass, for Cut Flowers, ... 1 00
Mrs. E. M. Gill, for Basket of Flowers, . . . 1 00
Mrs. C. N. S. Horner, Native " . . . 3 00

CHRYSANTHEMUM SHOW.

NOVEMBER 10.

CHRYSANTHEMUMS.—For the best six distinct named Large Flowered varieties, to C. M. Atkinson, . .	$10 00
For the second best, to H. L. Higginson, . .	6 00
For the best six distinct named Pompons, to H. L. Higginson, ...	10 00
For the second best, to C. M. Atkinson, . .	6 00
For the best four named Liliputians, to H. L. Higginson, ...	4 00
For the best specimen plant, to H. L. Higginson, .	5 00
For the second best, to C. M. Atkinson, . .	3 00
For the best twelve named Large Flowered varieties, cut specimens, to H. L. Higginson, ...	3 00
For the second best, to C. M. Atkinson, . .	2 00
For the best twelve named Pompon varieties, cut specimens, to H. L. Higginson, ...	3 00
For the second best, to C. M. Atkinson, . .	2 00
For the best general display of named or unnamed varieties, cut specimens, to E. Sheppard, . .	5 00
For the second best, to B. G. Smith, . . .	4 00
For the third best to H. L. Higginson, . . .	3 00
BASKET OF FLOWERS.—For the best arranged, to Mrs. A. D. Wood, ...	3 00
For the second best, to Mrs. S. Joyce, . . .	2 00
HAND BOUQUETS.—For the best pair, to James Nugent,	3 00
For the second best, to James O'Brien, . . .	2 00

Gratuities:—

To H. L. Higginson, for Chrysanthemums, . .	8 00
J. B. Moore, " " . .	5 00
James Comley, " " . .	4 00
C. M. Atkinson, " " . .	2 00
James Nugent, " " . .	1 00
Edward Butler, " *Calanthes*, ...	5 00
J. B. Moore, " *Cypripedium insigne*, . .	2 00

To Miss S. W. Story,	for	*Eulalia Japonica*,	$1 00
M. H. Merriam,	"	Roses,	1 00
W. J. Vass,	"	Plants and Flowers,	2 00
Hovey & Co.,	"	Plants,	3 00
J. B. Moore,	"	Table Design,	3 00
James Comley,	"	Cut Flowers,	2 00
Mrs. E. M. Gill,	"	" "	1 00
E. H. Hitchings,	"	*Botrychium ternatum*,	2 00

DECEMBER 1.

Gratuities: —

To W. J. Vass,	for	*Gesnera splendidissima* and *G. zebrina*,	2 00
James Cartwright,	for	*Cattleya Loddigesii*,	1 00
Mrs. A. D. Wood,	for	Dish of Flowers,	1 00

DECEMBER 29.

Gratuities: —

To James Cartwright,	for	*Cypripedium insigne*,	1 00
H. H. Hunnewell,	for	*Euphorbia plenissima fl. pl.*,	1 00

The following Medals and Certificates of Merit have been awarded: —

February 24. To Marshall P. Wilder, for Seedling Azaleas, First Class Certificate of Merit.

April 7. To C. B. Gardiner, for fine Cyclamen, Silver Medal.

Rose Show, June 20. To Byron D. Halsted, for a collection of Lichens, Silver Medal.

To Edward Butler, for Seedling *Dracœna*, *Wellesleyana*, Silver Medal.

To J. Warren Merrill, for a new and rare Fern, *Polystichium lepidocaulon*, First Class Certificate of Merit.

To George E. Davenport, for a splendid collection of Hardy Native Ferns, Silver Medal.

Annual Exhibition. To H. H. Hunnewell, for the best new Pot Plant, *Phyllotœnium Lindeni*, Silver Medal.

To Edward Butler, for Seedling *Dracœna*, No. 3, Silver Medal.

The amount awarded to each contributor is as follows: —

Ames, F. L.	$8 00	Hovey & Co.	$421 00
Andrews, F. W.	18 00	Hovey, J. C.	63 00
Atkinson, C. M.	240 00	Hunnewell, H. H.	91 00
Barnes, Parker	7 00	Jenks, C. W.	2 00
Beckford, D. R., Jr.	21 00	Joyce, Mrs. S.	64 00
Blanchard, J. W.	2 00	Kenrick, Miss A. C.	6 00
Bradbury, Miss S. A.	1 00	Latham, Mrs. W.	1 00
Brewer, Miss F.	1 00	McLaren, A.	23 00
Butler, Edward	20 00	McTear, W. G.	10 00
Carter, Miss M. E.	7 00	Mead, Mrs. A. S.	2 00
Cartwright, James	15 00	Merriam, M. H.	14 00
Chaffin, J. C.	15 00	Merrill, J. W.	90 00
Chase, Mrs. C. B.	5 00	Mitchell, E. W.	5 00
Clark, M. W.	1 00	Moore, J. B.	222 00
Comley, James	83 00	Morandi, F. W.	4 00
Craft, George	59 00	Needham, Mrs.	1 00
Davenport, George E.	23 00	Nugent, James	70 00
Dawson, Jackson	1 00	O'Brien, J.	44 00
Deeterich, Carl	3 00	Park, J. C.	3 00
Duffley, Daniel	5 00	Parker, John	4 00
Fessenden, B. F.	1 00	Parkman, Francis	53 00
Foster, L. H.	3 00	Putnam, Francis	3 00
Frost, Stiles	1 00	Rand, E. S., Jr.	13 00
Gardiner, C. B.	19 00	Rand, Harry L.	9 00
Gilbert, A. B.	10 00	Randall, Macey	35 00
Gill, Mrs. E. M.	104 00	Richards, J. S.	106 00
Gleason, Herbert	12 00	Russell, Mrs. N. P.	2 00
Goodwin, Henry W.	2 00	Sheppard, E.	27 00
Gray, William, Jr.	95 00	Smith, B. G.	14 00
Gray, William, 3d,	26 00	Spalding, M. D.	8 00
Grundel, H.	10 00	Spooner, W. H.	15 00
Hall, E. A.	2 00	Stone, S. G.	29 00
Halliday, W. H.	5 00	Story, E. A.	10 00
Halstead, B. D.	59 00	Story, Miss S. W.	18 00
Hartwell, Samuel	2 00	Strong, W. C.	77 00
Hayes, F. B.	2 00	Tallant, Hugh	1 00
Higginson, H. L.	42 00	Vass, W. J.	48 00
Hitchings, E. H.	23 00	Webster, F.	2 00
Horner, Mrs. C. N. S.	58 00	Wellington, C. W. W.	3 00

Weston, Mrs. L. P. .	$8 00	Wood, Mrs. A. D. .	$48 00
Wheeler, Miss A. C. .	13 00	Wood, E. W. . .	10 00
Wilder, Marshall P. .	28 00	Wood, W. K. . .	70 00
Wilmarth, Mrs. H. D.	2 00	Young, H. A. . .	2 00
Wolcott, Mrs. J. W. .	2 00		

Amount appropriated, . . .	$3,000 00
" awarded, . . .	2,673 00
Balance, . .	$327 00
Amount awarded for Special Prizes, . .	$164 00

REPORT

OF THE

COMMITTEE ON FRUITS,

FOR THE YEAR 1877.

By HERVEY DAVIS, Chairman.

The season now drawing to a close, has been very favorable for nearly all kinds of Fruits, and the exhibitions will compare very satisfactorily with those of the past few years, in regard to all fruits, excepting apples and blackberries. The show of apples has been the most inferior for several years, which is much to be regretted, as this is the most valuable fruit of the New England States, and the small crop will be a serious and irreparable loss.

It gives us much pleasure to see the interest that many of our oldest contributors still continue to manifest in our exhibitions; most prominent among whom may be mentioned Hon. Marshall P. Wilder and the Messrs. Hovey, all of whom joined the Society soon after its formation, now nearly half a century ago, the last Annual Exhibition having been the Forty-ninth. And while we speak of those who are with us, it is sad to recall how many of our most constant exhibitors are gone. Among those most prominent and greatly missed, it may not be out of place to mention, as always present at our exhibitions, Josiah Stickney, Francis Dana, Frederick Clapp, Joseph H. Fenno, and B. B. Davis; all of them very active and constant contributors. But while we mourn the loss of those tried friends, we are glad to see coming forward to take their places so many young and enthusiastic persons, who, we doubt not, will make our exhibitions as good and interesting as those of past years. It is also very gratifying to see the general interest manifested at the present time, in originating new hybrid and other seedlings of different species of fruits, which must in the near future,

result in giving us some very desirable new kinds. When we look upon the valuable collection of seedling pears, originated by Messrs. F. & L. Clapp, and the strawberries and grapes originated by John B. Moore, in the past few years, we have confidence in expressing the opinion that the time is not far distant, when we shall see many more valuable new seedling fruits exhibited on our tables.

Strawberries.—Some very fine forced strawberries were exhibited by James Comley, March 10th, and again on March 24th and 31st, Mr. Comley being the only person who has shown forced strawberries in any amount during the season. Strawberries grown in frames under glass were shown by Charles Garfield, May 26th and June 2d. The season was very favorable for the strawberry, and the exhibition of this fruit has been up to the average of the past few seasons. Those most worthy of note, were the General Sherman, Hervey Davis, and Belle, shown by John B. Moore, and the Belle and Col. Cheney, shown by George Hill. At the Rose Show, June 20th, the first prize for the best four quarts of any variety, was awarded to the Hervey Davis, and the second to the General Sherman.

At the Strawberry Show, June 27th, the first prize for the best four quarts of any variety, was awarded to the Belle. We wish again to call attention to the very remarkable success Mr. Moore has had in raising seedlings, he having originated the General Sherman, Belle, and Hervey Davis. The last was shown in 1876, as No. 26, and for a description of the same, reference is made to the report of that year, page 87. The General Sherman is an early fruit, very large and handsome; quality, good. The Hervey Davis is also a very large fruit; quality, very good to best. Mr. Moore thinks this the most valuable seedling he has raised, as it is very hardy and prolific; it is an early variety. The Belle is the largest of any of Mr. Moore's seedlings, and we think it the largest strawberry ever exhibited on our tables. It is not as regular in form as the other two, many of the berries being inclined to the cockscomb shape; the quality is good. Much has been said in favor of the Monarch of the West, Star of the West, and the Great American, but we believe either of those raised by Mr. Moore is in all respects superior to any of them.

There have been but few seedlings exhibited for the first time this season, and none worthy of any particular note, except one shown by John B. Moore, which he has named Walden, and which

we think may prove very valuable, as it is of good size and very good quality.

Cherries.—The season has been favorable for this fruit, and the exhibitions have been very good. C. E. Grant exhibited the following varieties June 27th: Black Heart, Elton, Black Tartarian, and Black Eagle. James Nugent showed Walshs' No. 4. July 7th, Marshall P. Wilder exhibited two new seedlings, one of them from seed of the Downer's Late, though not quite as good in quality, but may still prove valuable as a late variety. July 14th, C. N. Brackett exhibited two seedlings, Nos. 1 and 2. No. 1 was considered much superior to the other, and may be called good. Warren Fenno exhibited his seedling Norfolk; this is considered the best cherry shown during the season.

Currants.—The exhibitions of this fruit have been better than last season. They have been made by about the same persons, and of the same varieties. The first prize for the best four varieties was awarded to the following collection shown by C. M. Atkinson: Victoria, La Versaillaise, Dana's Transparent and Black Naples. The specimens of Victoria, which has not been shown before for some years, were very handsome, and gave evidence of the most skilful cultivation.

Gooseberries.—The exhibitions of this fruit, particularly the foreign varieties, have been better than the past few years. The fruit has been very large, handsome, and well ripened, and very free from mildew, which is generally the trouble in growing foreign varieties in this country.

Raspberries.—The exhibitions of this fruit were not up to the average of the past few seasons, though better than last year; the varieties about the same. July 21st, the first prize was awarded to the Saunders, and the second to the Herstine. The Franconia has been much better this season, than the previous year. Marshall P. Wilder exhibited some specimens of a variety not often seen, the Souchetii.

Blackberries.—The exhibitions of this very valuable fruit have improved somewhat from last season, but not as much as we desire to see them. There has been some very fine fruit shown this year. The dish of Wilson's Early, exhibited by Messrs. F. & L. Clapp, July 28th, was very large and fine. James Nugent has also shown some very good Dorchesters. The other varieties have not been as good as in former seasons.

Plums.—The exhibition of Plums has been about up to the average of the past few seasons. Stiles Frost has shown some very fine specimens during the year, and was awarded the first and second prizes, August 25th, for Prince's Yellow Gage and Lombard. August 18th, Warren Fenno received the first prize for Washington. At the Annual Exhibition, the first prize was given to Stiles Frost, for Reine Claude de Bavay.

Nectarines.—The only specimens of this fruit were shown by John Falconer, who received the first and second prizes, for Albert Victor and Reine Victoria. They were very fine specimens, grown in the orchard house.

Figs.—There is not much interest taken in growing or exhibiting this fruit, Mrs. Benjamin Fobes being the only person showing any during the season.

Peaches.—We have nothing to report on forced peaches, none of the prizes having been awarded. Peaches of orchard-house culture were shown at the Annual Exhibition by John Falconer, who made a very fine display, taking all the premiums offered with the following varieties: first prize for Stump the World; second, for Rivers' Princess of Wales; third, for Richmond; fourth, for Raymackers. These were all very handsome specimens. The display of out-door peaches was better than last season; the Foster peach received the first prize for a single dish, and there were more of this variety on our tables than of any other, showing that the season has been favorable for them, or else people are growing them in preference to other varieties. Seedlings were shown by Philander Ames and Warren Fenno.

Apples.—We are obliged to report the poorest display of apples during the season that has been made for a large number of years, and we think it can be accounted for by the uncommonly small crop in this and all the New England States. We are aware that this is what is called the "off year," or, in other words, the year that most of the orchards in this section of the country yield a very small crop. We give the number of dishes of the different varieties, for comparison with last year: —

Baldwin,	11	Gravenstein,	6
Dutch Codlin,	4	Hubbardston,	7
Fall Orange,	1	King of Tompkins County,	3
Golden Russet,	1	Lyscom,	1

Maiden's Blush, . .	2	Pumpkin Sweet, . .	1
Minister, . . .	1	R. I. Greening, . .	2
Mother, ...	3	Roxbury Russet, . .	9
Northern Spy, . .	1	Washington Strawberry, .	1
Porter, ...	8		

The above list comprises sixty-two dishes; and last year, at our Annual Exhibition, we had one hundred and seventy-six dishes.

July 7th, Marshall P. Wilder presented some specimens of Haines' Seedling apple, from M. Cole & Co., of Atlanta, Ga. The fruit was not in a perfect condition for trial, being partly decayed from being sent so long a distance at that season of the year. It was very large and handsome; quality, good; not unlike the Gravenstein in flavor.

It gives us much pleasure to acknowledge the receipt on the 15th of December, from the Fruit Growers' Association and International Show Society, of Halifax, Nova Scotia, from which we have before received similar favors, of the largest and finest collection of apples placed on our tables this year. They were mostly gathered from the orchard of Robert W. Starr, the Secretary of the Society, and that of his brother. We regret very much that owing to their having been gathered and packed for some time, a portion of the specimens, particularly the early varieties, were decayed and not in a condition to test. The Committee considered the collection a remarkably fine one for any section, and more particularly so as coming from so far East, and where the season is so short and cold. We desire to mention a few of the varieties, which were extra fine: Blue Pearmain, King of Tompkins County, Blenhein Pippin, Ribston Pippin, Yellow Bellflower, Cabashea or Twenty Ounce *Pippin*, Rose, Alexander, Fallawater, Starratt, Cayuga Red Streak or Twenty Ounce *Apple*, and Red Cheek or Monmouth Pippin. We think the above-named varieties were quite as good as the same varieties grown in the New England States. We were much gratified to see for the first time, Cox's Orange Pippin, an apple of English origin, and a favorite variety in England. It is of medium size, roundish; yellow, streaked and clouded with red; flesh, yellow and very rich. It ripens from October to February. As a whole this collection of apples was much less ribbed than those generally received from Nova Scotia. None of them were striking in this respect except the White Calville, which is always much ribbed wherever grown. This evenness of form is accounted for by the

fact that the collection was originally made for the purpose of modelling from, and perfection of form and color were sought rather than size, which ruled in the collection sent in 1874.

Pears.—It gives us much pleasure to be able to report a very fine display of this fruit during the entire season. At the weekly shows and at the Annual Exhibition, prizes were offered, as last year, only for single dishes. We are satisfied that this is the best method of offering and awarding prizes, as in all cases the best fruit receives the premiums, if the judgment of the Committee is correct. The varieties most worthy of particular mention this season are the Bartlett, Souvenir du Congrès, Duchesse, Winter Nelis, and Doyenne du Comice. At the Annual Exhibition the show of Bartletts was one of the best ever made by this Society, there being twenty-eight dishes, and most of them very fine. The four dishes receiving the prizes weighed, respectively, 9 lbs. $3\frac{1}{4}$ ozs., 9 lbs. 2 ozs., 9 lbs. $\frac{1}{2}$ oz., and 8 lbs. $15\frac{1}{2}$ ozs. The pears which attracted most attention at the Annual Exhibition were the Souvenir du Congrès, from Warren Fenno. These were the finest specimens of the kind ever shown here, averaging a little over a pound each in weight, and the largest measuring seven inches in length. For the information of the many who were so much interested in this superb dish of pears we will say, that in quality the variety will rank as "very good," and that the tree is a very vigorous grower. At the Annual Exhibition, A. J. Coe, of West Mendon, Conn., presented two specimens each of Beurre d'Anjou, Beurre Superfin, Lawrence, Vicar, and Winter Nelis. These were all quite large, but not as handsome or of as good shape as many dishes of the same varieties shown by other persons.

At the exhibition on the 6th of October, the most remarkable display was of the Duchesse; there being twenty-six dishes, most of them very fine; the three dishes receiving the several premiums weighed as follows: 13 lbs. $5\frac{1}{2}$ ozs., 13 lbs. $4\frac{3}{4}$ ozs., 13 lbs. 4 ozs., and several of the other dishes were nearly as large.

November 3, M. Morse had a remarkable dish of Doyenne du Comice. November 10th, at the annual show of winter pears, the display was very fine—much above the average of the past few years. We think we can say without any doubt, that the dish of Winter Nelis, receiving the first prize, was the largest and handsomest dish of this variety ever shown at any of our exhibitions, and we think we can challenge California to produce a dish that

would equal it in size and beauty. The weight was 7½ lbs. December 1st, Alexander Greenlaw exhibited a very fine dish of Winter Nelis; December 13th, A. S. M'Intosh a fine dish of Glout Morceau, and Mrs. H. V. Draper a good dish of Columbia.

On the 13th of October, Marshall P. Wilder presented the Docteur Lentier, a new variety. Large, obovate pyriform, somewhat irregular; pale greenish yellow, with dots and splashes of thin russet, continuous around the eye and stem. Flesh white; fine grained, buttery, very juicy, sprightly and very sweet, with a pleasant aroma, and sometimes a little astringency. Quality, best.

October 27th, Mr. Wilder presented specimens of the following varieties, for the Committee to test their quality:

Emile d'Heyst.—This, we consider best in quality, and it is also large and handsome. It has been cultivated by Mr. Wilder for quite a number of years, but is not as widely known as it deserves to be; we think it should take the place of many varieties of its season not nearly as good in quality.

President.—One of Dr. Shurtleff's seedlings: large; quality very good; it promises to be a valuable pear for market.

Roitelet.—Quality good.

January 27th, Marshall P. Wilder left with the Committee for trial, specimens, of the growth of 1876, of a seedling pear from B. S. Fox, of California, which he has named Col. Wilder. The fruit was very much wilted, but we think that if properly kept until in eating order, it might be melting and buttery, and rank as very good. September 29th, a large collection of seedlings raised by Mr. Fox was received, through Mr. Wilder, for exhibition and trial. Many of them arrived in bad condition, owing to their having been exhibited at the meeting of the American Pomological Society at Baltimore, and could not be fairly tested. The following are brief descriptions of some of the best varieties:

Fox's No. 64.—Medium size, or large; elongated pyriform; colored throughout with rich brownish red; resembles Bishop's Thumb in appearance; juicy and rich; a little too astringent; very good.

No. 52. Hardly medium size; pyriform; russet, with reddish cheek; juicy, sweet and good.

No. 153.—Medium size; obovate; yellow with thin russet and mottled red cheek, juicy; rich and very good, but a little too astringent.

No. 159.—Large, resembling the B. S. Fox (another of Mr. Fox's seedlings, which bears his name), in form and insertion of stem; also in color; more spirited and also more astringent.

No. 253.—Medium size; oblate; stem an inch and a half in length; yellow, juicy and good.

No. 157.—Large, green, with bloom; shaped like Glout Morceau; knobby, like Thompson, and ugly; rich, with flavor and texture resembling a greenflesh melon.

The Francis Dana pear was shown by Eliphalet Stone, at the Annual Exhibition. This was one of several seedlings, given to Mr. Stone, when young plants, by the late Francis Dana, and which he has named in memory of the originator. Full medium size; globular acute pyriform; skin, clear lemon yellow, with tracings of thin russet. In general appearance it resembles the Howell. Flesh, buttery, juicy, and of very good quality, but will not come up to best. Ripens the last of September. "Yellows up" very handsomely, and it is thought may become a valuable market pear.

October 20th, F. & L. Clapp, exhibited some of their seedlings or new varieties. No. 75, from Winter Nelis, we do not think any improvement over the parent. No. 127, from Urbaniste, was in quality very good to best. No. 22, or Frederick Clapp, will rank as best in quality, and the dish shown this year we think the finest ever exhibited. No. 12, or Newhall, was also very fine. No. 17, or Nicholas, was very good. All of the above seedlings have been described in previous reports. December 15, Messrs. Clapp presented a fine dish of their seedling, No. 17, which will rank as very good, and which we think will be valuable for market.

November 10th, Asahel Foote, of Williamstown, sent a dish of his seedling pear, Homestead, described in the "Second Appendix" to "Downing's Fruits of America." Pyriform; medium to large; quality good. There have been several other seedlings shown during the season, but none worthy of particular note, excepting one presented by Hovey & Co., November 10th; fruit medium to large, roundish, color russet, thickly covered with brownish dots; very juicy, but rather too acid.

Premiums were offered for forty different varieties of pears at the Annual Exhibition. The number of dishes of each variety offered for prizes was as follows:

Adams,	1	Flemish Beauty,	8
Andrews,	9	Goodale,	4
Bartlett,	28	Glout Morceau,	7
Belle Lucrative,	15	Howell,	16
Beurre d'Anjou,	20	Lawrence,	14
Beurre Bosc,	15	Louise Bonne of Jersey,	25
Beurre Clairgeau,	10	Marie Louise,	10
Beurre Diel,	11	Merriam,	11
Beurre Gris d'Hiver,	4	Moore's Pound,	2
Beurre Hardy,	17	Mount Vernon,	6
Beurre Langelier,	5	Onondaga,	11
Beurre Superfin,	12	Paradis d'Automne,	9
Buffum,	10	Pratt,	3
Caen du France,	4	Sheldon,	28
Dana's Hovey,	15	Souvenir du Congrès,	2
De Tongres,	6	Seckel,	28
Doyenne Boussock,	8	St. Michael Archangel,	7
Duchesse,	21	Urbaniste,	14
Doyenne du Comice,	12	Vicar,	6
Fulton,	6	Winter Nelis,	12

Native Grapes.—The show of this fruit has been about equal to the average of the past few seasons. Moore's Early was shown August 25th, by John B. Moore, and awarded a First Class Certificate of Merit. The fruit was well colored, but not fully ripe. September 1st, Moore's Early received the first prize for the best early grape. Champion was shown by Marshall P. Wilder. September 8th, Moore's Early, Concord, Delaware, and Hartford, received the prizes for early varieties, in the order named. September 29th, H. E. Hooker exhibited the Brighton grape. This is considered a very fine grape, and a valuable acquisition. The specimens shown were equal to any before exhibited. We do not see any reason to change our previous good opinion of it, if it proves hardy in all locations. It has been described in previous reports.

September 4th, Mr. Moore extended an invitation to the Fruit Committee and other gentlemen, to visit his place in order to examine his seedling grape, Moore's Early, and to compare it with the Concord and Hartford, growing side by side in the same vineyard, with the same soil and cultivation. We found the Moore's

Early fully ripe, and bearing an abundant crop on all of the vines, comprising several hundred. To all appearance they had not received any extra care or cultivation. The soil was a light, sandy loam. The Concords and Hartfords were neither of them ripe, and to all appearance would not be for two or three weeks. Mr. Moore has offered this grape for the Prospective Prize, for the best seedling grape. Your Committee have seen the fruit on exhibition for five years previous to this; it having been first exhibited in 1872. It has received the first prize for the best early grape every year for the last four years. The Committee have also seen it growing in the vineyard the past two seasons, and are fully and unanimously of the opinion that Mr. Moore is entitled to the prize for which he has offered it. Your Committee would, therefore, unanimously recommend to the Society, that John B. Moore be awarded the prize of sixty dollars for his seedling grape, Moore's Early.

The exhibition of grapes on the 6th of October, was very good. The Concords shown by Mr. Blanchard were very fine bunches — very large and well shouldered, but not as ripe or as sweet as those shown last year. The Crevelings shown by B. G. Smith, were the best we have ever seen of that variety; the bunches were very large and full, which is not common with this kind. The Worden Grape was shown by A. F. Rice.

N. B. White has exhibited several of his seedlings during the season. We have nothing to say of them different from what has been said in previous reports.

Foreign Grapes.—The exhibition of foreign grapes has been as good during the season, as for the past few years. At the annual exhibition, B. G. Smith received the first prize for the best six varieties; Henry C. Cook, for the best four; E. W. Wood, for the best three, and Stiles Frost for the best two. All of the above mentioned collections contained some very fine bunches, and most of the fruit was well grown and well ripened. H. S. Mansfield and E. H. Luke had some very fine fruit in their collections.

Oranges, etc.—February 10th, Miss Marion C. Allen, exhibited some very fine oranges, and again, on the 2d of June. She has been the only person exhibiting this fruit during the season. August 11th, Hovey & Co., exhibited a very fine spike of fruit of *Musa Cavendishii* (Dwarf Banana), containing a large number of specimens, and well grown.

At the Annual Exhibition, the number of dishes of the several fruits was as follows:

Number of dishes of	Pears,	. . .	637
" "	Apples,	. . .	74
" "	Foreign Grapes,	. .	36
" "	Native "	. .	57
" "	Peaches,	. .	46
" "	Nectarines,	. .	2

Making in all, 852 dishes, of all varieties of fruit. In 1876, there were 1,011 dishes.

Premiums and gratuities have been awarded to one hundred and forty different persons. The annexed list of awards shows the amount of prizes to be $1,288; gratuities $336; total, $1,624; balance unexpended, $276. The above mentioned amount of premiums includes the Prospective Prize of $60, awarded to John B. Moore, for his seedling grape, Moore's Early. The large unexpended balance is mainly due to the fact that, owing to the small crop of apples, few prizes have been awarded for that fruit.

All of which is respectfully submitted.

HERVEY DAVIS,
P. B. HOVEY,
JOHN B. MOORE,
BENJ. G. SMITH,
E. W. WOOD,
C. F. CURTIS,
D. T. CURTIS,

Fruit Committee.

PRIZES AND GRATUITIES AWARDED FOR FRUITS.

January 6.

Winter Pears.—For the best, to J. H. Fenno, for Josephine de Malines,	$3 00
For the second best, to John L. Bird, for Winter Nelis,	2 00
Winter Apples.—For the best, to William T. Hall, for Northern Spy,	3 00
For the second best, to Asa Clement, for Baldwin,	2 00

Gratuities:—

To John L. Bird, for Passe Colmar Pears,	1 00
W. P. Walker, for Easter Beurre Pears,	1 00
B. G. Smith, for Pears,	1 00
F. & L. Clapp, for Seedling Pears, No. 64,	1 00
Asa Clement, for collection of Apples,	2 00
Edwin Fletcher, " " "	2 00
Benjamin P. Ware, for " "	2 00
J. H. Fenno, for Apples,	1 00

January 13.

Gratuity:—

To O. B. Hadwen, for collection of Apples,	2 00

February 3.

Winter Pears.—For the best, to Joseph H. Fenno, for Josephine de Malines,	3 00
For the second best, to Joseph H. Fenno, for Duchesse de Bordeaux,	2 00
Winter Apples.—For the best, to Willlam T. Hall, for Northern Spy,	3 00
For the second best, to Asa Clement, for Fallawater,	2 00

Gratuities:—

To Miss A. C. Wheeler, for Beurre d'Anjou Pears,	$1 00
O. B. Hadwen, for collection of Apples,	2 00
Asa Clement, " " "	2 00
Samuel Hartwell, " " "	2 00
Joseph H. Fenno, " Apples,	1 00

February 10.

Gratuity:—

To Miss Marion C. Allen, for Oranges,	2 00

March 3.

Winter Pears.—For the best, to Joseph H. Fenno, for Duchesse de Bordeaux,	3 00
For the second best, to Joseph H. Fenno, for Easter Beurre,	2 00
Winter Apples.—For the best, to William T. Hall, for Northern Spy,	3 00
For the second best, to Samuel Hartwell, for Hunt Russet,	2 00

Gratuities:—

To C. E. Grant, for Apples and Pears,	1 00
B. G. Smith, for Pears,	2 00
F. & L. Clapp, for Seedling Pears, No. 64,	2 00
Samuel Hartwell, for Apples,	1 00
Miss A. C. Wheeler, for Apples,	1 00

March 10.

Gratuity:—

To James Comley, for Forced Strawberries,	3 00

March 24.

Gratuities:—

To James Comley, for Strawberries,	3 00
O. B. Hadwen, for collection of Apples,	2 00

March 31.

Gratuities:—

To James Comley, for Strawberries,	1 00
J. H. Fenno, for Apples and Pears,	2 00

April 7.

Gratuities: —

To R. Manning, for Apples and Pears,	$2 00
C. E. Grant, " " " "	2 00
Mrs. C. N. S. Horner, for collection of Apples,	2 00
Samuel Hartwell, for Apples,	2 00
Miss A. C. Wheeler, for Apples,	1 00
James Comley, for Strawberries,	2 00

May 26.

Gratuity: —

To Charles Garfield, for Strawberries,	3 00

June 2.

Grapes.—For the best two bunches, to Peter Smith, for Black Hamburg,	10 00
For the second best, to Peter Smith, for Zinfindal,	6 00
Strawberries.—For the best, to Charles Garfield, for Triomphe de Gand,	5 00

Gratuities: —

To Miss Marion C. Allen, for Lemons and Oranges,	2 00
Cephas H. Brackett, for Forced Peaches,	2 00

June 9.

Gratuity: —

To Charles Garfield, for Strawberries,	1 00

June 16.

Gratuities: —

To John B. Moore, for Hervey Davis and Gen. Sherman Strawberries,	5 00
E. P. Richardson, for Jenny Lind and Downer's Prolific Strawberries,	2 00
Warren Fenno, for Brighton Pine Strawberries,	1 00
Aaron D. Capen, for Charles Downing Strawberries,	1 00
Charles Garfield, for collection of Strawberries,	2 00
C. E. Grant, " " "	1 00
Wm. C. Child, " " "	2 00

ROSE SHOW.

June 20.

Strawberries.—For the best four quarts to John B. Moore, for Hervey Davis,	$8 00
For the second best, to John B. Moore, for Gen. Sherman,	6 00
For the third best, to George Hill, for Col. Cheney,	4 00
For the best two quarts, to C. M. Atkinson, for Jucunda,	4 00
For the second best, to J. C. Park, for Seth Boyden,	3 00
For the third best, to W. P. Walker, for Triomphe de Gand,	2 00
Forced Grapes.—Third prize for two bunches, to Cephas H. Brackett, for Black Hamburg,	3 00

Gratuities: —

To William C. Child, for collection of Strawberries,	3 00
C. E. Grant, " " "	2 00
Aaron D. Capen, for Charles Downing Strawberries,	1 00
E. P. Richardson, for Grace Strawberries,	1 00

June 23.

Gratuities: —

To John B. Moore, for Strawberries,	4 00
E. P. Richardson, " "	1 00
George Dorr, for Monarch of the West Strawberries,	1 00
Charles H. Wall, for Lennig's White "	1 00
C. E. Grant, for Cherries,	1 00

STRAWBERRY SHOW.

June 27.

Strawberries.—For the best four quarts, to John B. Moore, for Belle,	$10 00
For the second best, to George Hill, for Belle,	8 00
For the third best, to John B. Moore, for President Wilder,	6 00

For the best fifty berries, to John B. Moore, for Belle, $5 00
For the second best, to John B. Moore, for Walden, 3 00
For the best two quarts of Caroline, to John B. Moore, 4 00
For the second best, to E. P. Richardson, . . 3 00
For the best Champion, to E. P. Richardson, . . 3 00
For the second best, to J. C. Park, . . . 2 00
For the best Charles Downing, to J. C. Park, . . 3 00
For the second best, to John B. Moore, . . 2 00
For the best Col. Cheney, to J. C. Park, . . . 4 00
For the best Gen. Sherman, to John B. Moore, . . 4 00
For the best Hovey's Seedling, to Hovey & Co., . . 4 00
For the best Jenny Lind, to E. P. Richardson, . . 3 00
For Jucunda, the third prize, to C. E. Grant, . . 2 00
For the best President Wilder, to Horace Eaton, . 4 00
For the second best, to J. B. Moore, . . . 3 00
For the third best, to Marshall P. Wilder, . . 2 00
For the best Seth Boyden, to John C. Park, . . 3 00
For Triomphe de Gand, the second prize to W. P. Walker, ... 3 00

Cherries:—For the best four varieties, to C. E. Grant, for Black Heart, Black Eagle, Elton, and Black Tartarian, ... 6 00
For the best two quarts, to I. P. Langworthy, for Knight's Early Black, ... 4 00
For the second best, to C. E. Grant, for Black Tartarian, ... 3 00
For the third best, to James Nugent, for Walsh's No. 4, ... 2 00

Gratuities:—

To John C. Park, for Belle and Monarch of the West Strawberries, ... 3 00
Warren Fenno, for Monarch of the West Strawberries, 1 00
Horace Eaton, for Great American " . 1 00
John B. Moore, for trusses of Belle and Walden Strawberries, ... 2 00
Charles H. Wall, for Lennig's White Strawberries, . 2 00
H. C. Bowers, for Agriculturist " . 2 00
W. P. Walker, for Triomphe de Gand " . 1 00
E. P. Richardson, for collection of " . 2 00

To C. E. Grant, for collection of Strawberries, . . $2 00
Cephas H. Brackett, for Foreign Grapes, . . . 3 00
Aaron D. Capen, for collection of Cherries, . . 2 00
F. R. Shattuck, for Black Tartarian Cherries, . . 1 00
C. E. Grant, for Napoleon Bigarreau Cherries, . . 1 00

July 7.

Cherries.—For the best two quarts, to T. S. Lockwood, for Coe's Transparent, ... 4 00
For the second best, to George Dorr, for Downer's Late, ... 3 00
For the third best, to C. E. Grant, for Black Eagle, 2 00
Strawberries.—For the best two quarts to John B. Moore, for Belle, ... 4 00
For the second best, to John B. Moore, for Walden, 3 00

Gratuities:—

To E. P. Richardson, for Brincklé's Orange Raspberries, 2 00
Mrs. E. M. Gill, for Raspberries, ... 1 00
Warren Fenno, for Black Cap Raspberries and Currants, ... 2 00
B. G. Smith, for Currants, ... 2 00
W. K. Wood, " " 2 00

July 14.

Raspberries.—For the best two quarts, to Warren Fenno, for Saunders, ... 4 00
For the second best, to William G. Prescott, for Franconia, ... 3 00
For the third best, to Warren Fenno, for Herstine, . 2 00
Currants.—For the best four quarts of Red, to W. K. Wood, for La Versaillaise, ... 4 00
For the second best, to B. G. Smith, for La Versaillaise, ... 3 00
For the third best, to C. M. Atkinson, for La Versaillaise, ... 2 00
For the best four quarts of White, to B. G. Smith, for Transparent, ... 3 00
For the second best, to C. E. Grant, for White Dutch, ... 2 00

Gratuities:—

To C. N. Brackett, for Cherries,	$2 00
Warren Fenno, for Cherries and Currants,	2 00
Charles Garfield, for Currants and Raspberries,	2 00
Charles H. Hall, " " " "	2 00
C. M. Atkinson, for White Currants,	1 00
E. W. Mitchell, for Currants,	1 00
C. E. Grant, " "	1 00
Mrs. E. M. Gill, " "	1 00

JULY 21.

RASPBERRIES.—For the best two quarts, to J. B. Moore, for Saunders,	4 00
For the second best, to Warren Fenno, for Herstine,	3 00
For the third best, to Warren Fenno, for Saunders,	2 00
CURRANTS.—For the best collection, to C. M. Atkinson, for Victoria, La Versaillaise, Dana's Transparent, and Black Naples,	5 00
For the second best, to B. G. Smith, for Cherry, La Versaillaise, Transparent, and Black Naples,	3 00
For the best four quarts, to B. G. Smith, for La Versaillaise,	4 00
For the second best, to W. K. Wood, for La Versaillaise,	3 00
For the third best, to Mrs. E. M. Gill, for La Versaillaise,	2 00
GOOSEBERRIES.—For the best two quarts, to Charles Garfield, for Roaring Lion,	4 00
For the second best, to B. G. Smith, for Smith's Improved,	3 00
For the third best, to Charles Garfield, for Whitesmith,	2 00

Gratuities:—

To Marshall P. Wilder, for Souchetii Raspberries,	1 00
William G. Prescott, for Franconia Raspberries,	2 00
Charles Garfield, " " "	1 00
Mrs. E. M. Gill, " " "	1 00
John B. Moore, for Raspberries and Gooseberries,	2 00
C. E. Grant, for collection of Currants,	2 00

JULY 28.

BLACKBERRIES.—For the best, to F. & L. Clapp, for Wilson's Early,	$3 00
For the second best, to James Nugent, for Dorchester,	2 00
PEARS.—For the best Doyenne d'Eté, to Horace Eaton,	3 00
For the second best, to W. P. Walker,	2 00
For the third best, to Warren Fenno,	1 00

Gratuities:—

To Charles Garfield, for Royal George Gooseberries,	1 00
A. S. M'Intosh, for Dorchester Blackberries,	1 00
B. G. Smith, for " "	1 00
W. C. Child, for Kittatinny "	1 00
Warren Fenno, for Herstine Raspberries,	1 00
C. D. Kingman, for Foster Peaches,	2 00
Robert Manning, for Petit Muscat Pears,	1 00

AUGUST 4.

PEARS.—For the best Beurre Giffard, to Josiah Crosby,	3 00
For the second best, to Warren Fenno,	2 00
For the third best, to B. G. Smith,	1 00
For the best Doyenne d'Eté, to Warren Fenno,	3 00
For the second best, to George S. Harwood,	2 00
For the third best, to W. P. Walker,	1 00
For the best of any other variety, to Marshall P. Wilder, for Suprême de Quimper,	2 00
For the second best, to Warren Fenno, for Bloodgood,	1 00
APPLES.—For the best Large Yellow Bough, to Benj. B. Davis,	3 00
For the second best, to Warren Heustis,	2 00
For the best Early Harvest, to B. G. Smith,	3 00
For the second best, to Warren Fenno,	2 00
GOOSEBERRIES.—For the best two quarts of Native, to B. G. Smith, for Downing,	3 00

Gratuities:—

To C. N. Brackett, for Beurre Giffard Pears,	1 00
C. D. Kingman, for collection of Peaches,	3 00
J. Falconer, for Peaches and Apricots,	2 00

To B. G. Smith, for Gooseberries and Apples, . . $2 00
Robert Manning, for Amber Gooseberries, . . 1 00
Charles Garfield, for Gooseberries and Blackberries, . 2 00

August 11.

Gooseberries.—For the best two quarts of Foreign, to B. G. Smith, for Bang-up, ... 3 00
Apples.—For Large Yellow Bough, the second prize to G. M. Mellen, ... 2 00
For Red Astrachan, the second prize to J. T. Foster, 2 00
Third prize to H. T. Andrews, ... 1 00
For the best Williams, to B. G. Smith, . . . 3 00
For the second best, to George Hill, . . . 2 00
For the third best, to John Cummings, . . . 1 00
For the best of any other variety, to T. M. Davis, for Summer Harvey, ... 3 00
Pears.—For the best Beurre Giffard, to John Fillebrown, 3 00
For the second best, to Warren Fenno, . . . 2 00
For the third best, to William T. Hall, . . . 1 00
For the best of any other variety, to Marshall P. Wilder, for Suprême de Quimper, . . . 3 00
For the second best, to C. N. Brackett, for Brandywine, ... 2 00
For the third best, to Hovey & Co., for Brandywine, 1 00
Blackberries.—For the best, to James Nugent, for Dorchester, ... 3 00

Gratuities:—

To Charles Garfield, for Blackberries and Gooseberries, . 1 00
J. Cruickshanks, for Moorpark Apricots, . . . 1 00
C. D. Kingman, for collection of Peaches, . . 2 00
Marshall P. Wilder, for collection of Pears, . . 2 00
Hovey & Co., for spike of fruit of *Musa Cavendishii* (Dwarf Banana), ... 5 00

August 18.

Plums.—For the best dish, to Warren Fenno, for Washington, ... 3 00
For the second best, to Stiles Frost, for Prince's Yellow Gage, ... 2 00

Pears.—For the best Clapp's Favorite, to F. & L. Clapp,	$4 00
For the second best, to Horace Eaton,	3 00
For the third best, to Hovey & Co.,	2 00
For the fourth best, to T. M. Davis,	1 00
For the best of any other variety, to Warren Fenno, for Brandywine,	4 00
For the second best, to C. M. Atkinson, for Brandywine,	3 00
For the third best, to Marshall P. Wilder, for Sterling,	2 00
For the fourth best, to Alexander Dickinson, for Dearborn's Seedling,	1 00
Figs.—The second prize to Mrs. Benjamin Fobes, for Brown Turkey,	2 00

Gratuities:—

To James Nugent, for Dorchester Blackberries,	1 00
A. S. M'Intosh, for Clapp's Favorite Pears,	1 00
B. G. Smith, for Williams Apples,	1 00
J. L. D. Sullivan, for Peaches,	1 00
Edward Davenport, for Hale's Early Peaches,	1 00
J. T. Foster, for Lawn Peaches,	1 00
J. Cruickshanks, for Moorpark Apricots,	1 00

August 25.

Pears.—For the best Bartlett, to Alexander Dickinson,	4 00
For the second best, to W. P. Walker,	3 00
For the third best, to Horace Partridge,	2 00
For the fourth best, to John McClure,	1 00
For the best Boston, to Hovey & Co.,	3 00
For the best Rostiezer, to John McClure,	3 00
For the second best, to Horace Eaton,	2 00
For the third best, to J. T. Foster,	1 00
For the best Tyson, to A. S. M'Intosh,	3 00
For the second best, to Walker & Co.,	2 00
For the third best, to Hovey & Co.,	1 00
For the best Clapp's Favorite, to F. & L. Clapp,	4 00
For the second best, to A. S. M'Intosh,	3 00
For the third best, to Edward Davenport,	2 00
For the fourth best, to John McClure,	1 00

Plums.—For the best dish, to Stiles Frost, for Prince's Yellow Gage,	$3 00
For the second best, to Stiles Frost, for Lombard,	2 00
Peaches.—For the best dish, to Alexander Dickinson, for Hale's Early,	4 00
For the second best, to J. T. Foster, for Laura,	3 00
Figs.—The second prize to Mrs. Benjamin Fobes, for Brown Turkey,	1 00

Gratuities:—

To Hovey & Co., for collection of Pears,	2 00
Warren Heustis, for Bartlett Pears,	1 00
B. G. Smith, for Pears,	1 00

September 1.

Apples.—For the best, to G. M. Mellen, for Gravenstein,	4 00
For the second best, to Warren Fenno, for Gravenstein,	3 00
Pears.—For the best Bartlett, to George S. Harwood,	4 00
For the second best, to C. N. Brackett,	3 00
For the third best, to Hovey & Co.,	2 00
For the fourth best, to Alexander Dickinson,	1 00
For the best of any other variety, to Warren Fenno, for Brandywine,	4 00
For the second best, to B. G. Smith, for Duchesse de Berri,	3 00
For the third best, to W. P. Walker, for Belle Lucrative,	2 00
For the fourth best, to A. S. M'Intosh, for Tyson,	1 00
Native Grapes.—For the best six bunches of any variety, to John B. Moore, for Moore's Early,	4 00
For the second best, to J. W. Talbot, for Cottage,	3 00
For the third best, to Marshall P. Wilder, for Champion,	2 00

Gratuities:—

To C. E. Grant, for Pears and Grapes,	2 00
W. T. Hall, for Pears and Apples,	2 00
I. A. Morton, for Clapp's Favorite Pears,	1 00

To F. & L. Clapp, for Seedling Pear, No. 36, for its size and beauty,	$2 00
G. M. Mellen, for Apples,	1 00
J. L. D. Sullivan, for Seedling White Nectarine,	1 00
Miss A. C. Wheeler, for Seedling Peaches,	1 00
Stiles Frost, for collection of Plums,	2 00

SEPTEMBER 8.

APPLES.—For the best Gravenstein, to William T. Hall,	3 00
For the second best, to Walter Russell,	2 00
For the third best, to G. M. Mellen,	1 00
For the best Porter, to W. P. Walker,	3 00
For the second best, to C. L. Weston,	2 00
For the third best, to G. M. Mellen,	1 00
For the best of any other variety, to Warren Fenno, for Maiden's Blush,	3 00
For the second best, to C. N. Brackett, for Pumpkin Sweet,	2 00
PEARS.—For the best Andrews, to Horace Partridge,	3 00
For the second best, to Alexander Dickinson,	2 00
For the third best, to C. E. Grant,	1 00
For the best Belle Lucrative to Alexander Dickinson,	3 00
For the second best, to W. T. Andrews,	2 00
For the third best, to Walker & Co.,	1 00
For the best Doyenne Boussock, to O. B. Hadwen,	3 00
For the second best, to E. W. Wood,	2 00
For the third best, to T. M. Davis,	1 00
For the best of any other variety, to Walker & Co., for St. Michael Archangel,	3 00
For the second best, to Alexander Dickinson, for Stevens' Genesee,	2 00
For the third best, to W. P. Walker, for Doyenne Robin,	1 00
NATIVE GRAPES.—For the best of any variety, to John B. Moore, for Moore's Early,	4 00
For the second best, to Charles H. Wall, for Concord,	3 00
For the third best, to C. E. Grant, for Delaware,	2 00
For the fourth best, to Charles Garfield, for Hartford Prolific,	1 00

Peaches.—For the best, to J. T. Foster, for Foster, .	$4 00
For the second best, to Joshua Crane, for Foster .	3 00
For the third best, to W. T. Andrews, for Crawford's Early, ...	2 00
For the fourth best, to Samuel Hartwell, for Crawford Early, ...	1 00

Gratuities:—

To Benjamin F. Hunt, for collection of Pears, . .	2 00
C. N. Brackett, " " " " . . .	2 00
G. M. Mellen, for Flemish Beauty Pears, . . .	1 00
Warren Fenno, for Peaches and Pears, . . .	2 00
Dr. C. H. Johnson, for " " " . . .	1 00
Joseph L. Chase, for Smith's Orleans Plums, . .	1 00
C. D. Kingman, for Foreign Grapes, . . .	2 00

ANNUAL EXHIBITION.

September 18, 19, 20, and 21.

Apples.—For the best Baldwin, to B. G. Smith, . .	$4 00
For the second best, to J. T. Foster, . . .	3 00
For the third best, to Walter Russell, . . .	2 00
For the fourth best, to C. N. Brackett, . . .	1 00
For the best Dutch Codlin, to William T. Hall, . .	3 00
For the second best, to S. N. Gaut, . . .	2 00
For the best Fall Orange, to O. B. Hadwen, . .	3 00
For the best Gravenstein, to Walter Russell, . .	4 00
For the second best, to F. & L. Clapp, . . .	3 00
For the third best, to William T. Hall, . . .	2 00
For the fourth best, to Warren Heustis, . . .	1 00
For the best Hubbardston Nonsuch, to Walter Russell,	4 00
For the second best, to J. T. Foster, . . .	3 00
For the third best, to Josiah Crosby, . . .	2 00
For the fourth best, to C. N. Brackett, . . .	1 00
For the best Hunt Russet, to George Dorr, . .	4 00
For the second best, to C. L. Weston, . . .	3 00
For the best King of Tompkins County, to Hovey & Co.,	4 00
For the second best, to C. N. Brackett, . . .	3 00
For the third best, to Warren Fenno, . . .	2 00

For the best Lyscom, to O. B. Hadwen,	$3 00
For the best Maiden's Blush, to Warren Fenno,	3 00
For the best Minister, to William T. Hall,	3 00
For the best Northern Spy, to John W. Esterbrook,	4 00
For the second best, to Warren Fenno,	3 00
For the best Porter, to G. M. Mellen,	4 00
For the second best, to Walter Russell,	3 00
For the third best, to W. P. Walker,	2 00
For the fourth best, to J. T. Foster,	1 00
For the best Pumpkin Sweet, to Joseph Parker,	4 00
For the best Rhode Island Greening, to J. L. DeWolf,	4 00
For the second best, to Warren Fenno,	3 00
For the best Roxbury Russet, to John L. DeWolf,	4 00
For the second best, to S. N. Gaut,	3 00
For the third best, to Warren Heustis,	2 00
For the fourth best, to William A. Crafts,	1 00
For the best Washington Strawberry, to Warren Fenno,	3 00
PEARS.—For the best Adams, to Hovey & Co.,	3 00
For the best Andrews, to Horace Partridge,	4 00
For the second best, to S. G. Damon,	3 00
For the third best, to S. P. Langmaid,	2 00
For the best Bartlett, to S. P. Langmaid,	4 00
For the second best, to William R. Austin,	3 00
For the third best, to William A. Crafts,	2 00
For the fourth best, to John McClure,	1 00
For the best Belle Lucrative, to Isaac Oliver,	4 00
For the second best, to S. P. Langmaid,	3 00
For the third best, to Alexander Dickinson,	2 00
For the fourth best, to Augustus Parker,	1 00
For the best Beurre d'Anjou, to William R. Austin,	4 00
For the second best, to Timothy Corey,	3 00
For the third best, to S. P. Langmaid,	2 00
For the fourth best, to W. S. Janvrin,	1 00
For the best Beurre Bosc, to Augustus Parker,	4 00
For the second best, to William R. Austin,	3 00
For the third best, to Warren Fenno,	2 00
For the fourth best, to T. M. Davis,	1 00
For the best Beurre Clairgeau, to John L. DeWolf,	4 00
For the second best, to John Fillebrown,	3 00
For the third best, to Warren Fenno,	2 00

For the fourth best, to William R. Austin,	$1 00
For the best Beurre Diel, to Alexander Dickinson,	3 00
For the second best, to W. S. Janvrin,	2 00
For the third best, to John L. DeWolf,	1 00
For the best Beurre Gris d' Hiver Nouveau, to Warren Fenno,	3 00
For the second best, to Hovey & Co.,	2 00
For the best Beurre Hardy, to William R. Austin,	4 00
For the second best, to Edward Hyde,	3 00
For the third best, to A. S. M'Intosh,	2 00
For the fourth best, to Mrs. H. P. Kendrick,	1 00
For the best Beurre Langelier, to C. E. Grant,	3 00
For the second best, to W. P. Walker,	2 00
For the third best, to John L. Bird,	1 00
For the best Beurre Superfin, to T. M. Davis,	4 00
For the second best, to John C. Park,	3 00
For the third best, to Lewis Slack,	2 00
For the fourth best, to A. Dickinson,	1 00
For the best Buffum, to Marshall P. Wilder,	3 00
For the second best, to Horace Partridge,	2 00
For the best Caen du France, to Marshall P. Wilder,	3 00
For the second best, to C. E. Grant,	2 00
For the third best, to Amos Bates,	1 00
For the best Dana's Hovey, to Alexander Dickinson,	4 00
For the second best, to Hovey & Co.,	3 00
For the third best, to J. W. Merrill,	2 00
For the fourth best, to Eben Snow,	1 00
For the best De Tongres, to C. E. Grant,	3 00
For the second best, to T. M. Davis,	2 00
For the third best, to John L. Bird,	1 00
For the best Doyenne Boussock, to Hovey & Co.,	3 00
For the second best, to Marshall P. Wilder,	2 00
For the third best, to John L. DeWolf,	1 00
For the best Doyenne du Comice, to George S. Harwood,	4 00
For the second best, to William A. Craft,	3 00
For the third best, to Warren Fenno,	2 00
For the fourth best, to W. P. Walker,	1 00
For the best Duchesse d'Angouleme, to A. Dickinson,	4 00
For the second best, to J. F. Nickerson,	3 00

For the third best, to W. S. Janvrin, . . .	$2 00
For the fourth best, to Mrs. H. P. Kendrick, . .	1 00
For the best Flemish Beauty, to C. E. Grant, . .	3 00
For the second best, to E. H. Luke, . . .	2 00
For the third best, to J. F. Nickerson, . . .	1 00
For the best Fulton, to J. C. Park, ...	3 00
For the second best, to C. N. Brackett, . . .	2 00
For the third best, to J. T. Foster, . . .	1 00
For the best Glout Morceau, to J. F. Nickerson, .	3 00
For the second best, to Mrs. H. P. Kendrick, . .	2 00
For the third best, to J. Dana Hovey, . . .	1 00
For the best Goodale, to C. E. Grant, . . .	3 00
For the second best, to Warren Fenno, , . .	2 00
For the third best, to Marshall P. Wilder, . .	1 00
For the best Howell, to W. S. Janvrin, . . .	4 00
For the second best, to Jesse Haley, . . .	3 00
For the third best, to J. C. Park, ...	2 00
For the fourth best, to David W. Stowers, . .	1 00
For the best Lawrence, to S. P. Langmaid, . .	3 00
For the second best, to Warren Fenno, . . .	2 00
For the third best, to Eben Snow, ...	1 00
For the best Louise Bonne of Jersey, to Timothy Corey,	4 00
For the second best, to S. P. Langmaid, . .	3 00
For the third best, to Alexander Dickinson, . .	2 00
For the fourth best, to John McClure, . . .	1 00
For the best Marie Louise, to Hovey & Co., . .	4 00
For the second best, to Alexander Dickinson, . .	3 00
For the third best, to John L. De Wolf, . .	2 00
For the fourth best, to Walker & Co., . . .	1 00
For the best Merriam, to Josiah Crosby, . . .	4 00
For the second best, to Timothy Corey, . . .	3 00
For the third best, to S. G. Damon, . . .	2 00
For the fourth best, to A. S. M'Intosh, . . .	1 00
For the best Moore's Pound, to A. Dickinson, . .	3 00
For the second best, to Hovey & Co., . . .	2 00
For the best Mount Vernon, to Walker & Co., . .	3 00
For the second best, to A. McDermott, . . .	2 00
For the best Onondaga or Swan's Orange, to A. McDermott, ...	4 00
For the second best, to J. F. Nickerson, . .	3 00

For the third best, to Warren Fenno,	$2 00
For the fourth best, to John McClure,	1 00
For the best Paradis d' Automne, to Hovey & Co.,	3 00
For the second best, to Marshall P. Wilder,	2 00
For the third best, to John L. Bird,	1 00
For the best Pratt, to Hovey & Co.,	3 00
For the second best to Marshall P. Wilder,	2 00
For the best Seckel, to Mrs. H. P. Kendrick,	4 00
For the second best, to George S. Harwood,	3 00
For the third best, to Mrs. E. M. Gill,	2 00
For the fourth best, to John Fillebrown,	1 00
For the best Sheldon, to George S. Harwood,	4 00
For the second best, to C. N. Brackett,	3 00
For the third best, to Horace Eaton,	2 00
For the fourth best, to W. S. Janvrin,	1 00
For the best Souvenir du Congrès, to Warren Fenno,	3 00
For the second best, to Marshall P. Wilder,	2 00
For the best St. Michael Archangel, to Jesse Haley,	4 00
For the second best, to Hovey & Co.,	3 00
For the third best, to T. M. Davis,	2 00
For the fourth best, to A. Dickinson,	1 00
For the best Urbaniste, to Timothy Corey,	4 00
For the second best, to Hovey & Co.,	3 00
For the third best, to William A. Crafts,	2 00
For the fourth best, to Walker & Co.,	1 00
For the best Vicar of Winkfield, to W. S. Janvrin,	3 00
For the second best, to John McClure,	2 00
For the third best, to Horace Eaton,	1 00
For the best Winter Nelis, to S. G. Damon,	3 00
For the second best, to W. P. Walker,	2 00
For the third best, to John L. Bird,	1 00
PEACHES.—For the best dish, to J. T. Foster, for Foster,	4 00
For the second best, to Horace Eaton, for Oldmixon,	3 00
For the third best, to J. F. Nickerson, for Foster,	2 00
For the best dish, of orchard house culture, to John Falconer, for Stump the World,	5 00
For the second best to John Falconer, for River's Prince of Wales,	4 00
For the third best, to John Falconer, for Richmond,	3 00
For the fourth best, to John Falconer, for Raymacker's,	2 00

NECTARINES.—For the best dish, to John Falconer, for Albert Victor,	$4 00
For the second best, to John Falconer, for Reine Victoria,	3 00
PLUMS.—For the best dish, to Stiles Frost, for Reine Claude de Bavay,	3 00
For the second best, to Stiles Frost, for Schuyler's Gage,	2 00
NATIVE GRAPES.—For the best Adirondac, to S. G. Damon,	3 00
For the best Concord, to N. Blanchard,	4 00
For the second best, to Joseph S. Chase,	3 00
For the third best, to M. Muldoon,	2 00
For the best Delaware, to E. Myrick,	3 00
For the second best, to Thomas S. Lockwood,	2 00
For the third best, to Warren Fenno,	1 00
For the best Hartford, to J. W. Talbot,	3 00
For the second best, to S. G. Damon,	2 00
For the third best, to John B. Moore,	1 00
For the best Israella, to S. G. Damon,	3 00
For the best of any other early variety, to J. B. Moore, for Moore's Early,	3 00
For the second best, to Benjamin G. Smith, for Creveling,	2 00
For the third best, to E. Myrick, for Eumelan,	1 00
FOREIGN GRAPES.—For the best six varieties, to Benjamin G. Smith, for Golden Hamburg, Wilmot's Hamburg, Black Hamburg, Muscat Hamburg, Lady Downe's Seedling, and Red Chasselas,	12 00
For the second best, to H. S. Mansfield, for Golden Hamburg, Black Hamburg, Muscat of Alexandria, Royal Muscadine, Black Prince, and Red Chasselas,	10 00
For the best four varieties, to Henry C. Cook, for Victoria Hamburg, Black Hamburg, Rose Chasselas, and Chasselas de Fontainbleau,	8 00
For the best three varieties, to E. W. Wood, for Victoria Hamburg, Black Hamburg, and Golden Hamburg,	6 00
For the second best, to Augustus Parker, for Muscat of Alexandria, Muscat Hamburg, and Black Hamburg,	5 00

For the third best, to E. H. Luke, for Muscat Hamburg, Black Hamburg, and Buckland Sweetwater,	$4 00
For the best two varieties, to Stiles Frost, for Black Hamburg and Wilmot's Hamburg, . . .	5 00
For the second best, to C. E. Grant, for Black Hamburg and White Chasselas, ...	4 00
For the third best, to B. G. Smith, for Victoria Hamburg and Red Chasselas, ...	3 00
For the best two bunches of any White Grape, to H. S. Mansfield, for White Frontignan, . . .	5 00
For the second best, to Daniel Curtin, for White Chasselas, ...	4 00

Gratuities for Pears:—

To M. W. Chadbourne, for collection, ...	3 00
Benj. F. Hunt, " "	3 00
F. J. Baxter, " "	2 00
John Cummings, " "	2 00
William C. Child, " "	2 00
C. E. Grant, " "	2 00
Frank M. Gilley, " "	2 00
C. N. Brackett, " "	2 00
J. B. Moore, " "	2 00
Horace Partridge, " "	2 00
James Cruickshanks, " "	2 00
S. N. Gaut, " "	1 00
Josiah Crosby, " "	1 00
S. A. Merrill, " "	1 00
Mrs. F. Nichols, " "	1 00
Parker Barnes, " "	1 00
Mrs. H. P. Kendrick, for Kingsessing Pears, . .	1 00
Miss H. M. Young, for Dana's America Pears, .	1 00
Walker & Co., for Walker Pears, ...	1 00
D. W. Lothrop, for Seedling Pear, ...	1 00

Gratuities for Peaches:—

To William C. Child, ...	2 00
Joseph S. Chase, ...	1 00
Philander Ames, ...	1 00
Amos Nickerson, ...	1 00

To Warren Fenno, ... $1 00
J. Dana Hovey, ... 1 00

Gratuities for Grapes, etc.:—

To B. G. Smith, for Foreign Grapes 2 00
John B. Moore, for collection of Native Grapes, . 2 00
M. H. Merriam, for Diana, ... 1 00
Eben Snow, for Iona, ... 1 00
N. B. White, for Native Grapes, ... 1 00
G. F. Waters, for Fall Harvey Apples, . . . 1 00
Miss Sarah W. Story, for Fruit Design, . . . 2 00

SEPTEMBER 29.

Gratuities:—

To Lewis Slack, for collection of Pears, . . . 2 00
George H. Rogers, for Seckel Pears, . . . 1 00
John C. Newton, for St. Michael Pears, . . . 1 00
Asa Bullard, for Duchesse Pears, ... 1 00
C. E. Grant, for Pears and Grapes, ... 1 00
G. M. Mellen, for Porter Apples, ... 1 00

OCTOBER 6.

PEARS.—For the best Beurre Bosc, to T. M. Davis, . 4 00
For the second best, to Warren Fenno, . . . 3 00
For the third best, to S. N. Gaut, ... 2 00
For the best Beurre Clairgeau, to Jesse Haley, . . 4 00
For the second best, to John Fillebrown, . . 3 00
For the third best, to S. G. Damon, . . . 2 00
For the best Beurre Diel, to T. M. Davis, . . . 4 00
For the second best, to E. L. Draper, . . . 3 00
For the third best, to R. W. Ames, . . . 2 00
For the best Doyenne du Comice, to Warren Fenno, . 4 00
For the second best, to Hovey & Co., . . . 3 00
For the third best, to J. C. Park, ... 2 00
For the best Duchesse, to A. Dickinson, . . . 4 00
For the second best, to J. V. Wellington, . . 3 00
For the third best, to T. M. Davis, . . . 2 00
For the best Louise Bonne of Jersey, to John McClure, 4 00
For the second best, to A. Dickinson, . . . 3 00
For the third best, to T. M. Davis, . . . 2 00

For the best Urbaniste, to John L. Bird,	$4 00
For the second best, to Jesse Haley,	3 00
For the third best, to Hovey & Co.,	2 00
Apples.—For the best Fall Orange, to Charles Stearns,	3 00
For the best Gravenstein, to F. & L. Clapp,	3 00
For the second best, to Charles Stearns,	2 00
For the best Porter, to G. M. Mellen,	3 00
For the second best, to S. N. Gaut,	2 00
For the best Washington Strawberry, to Warren Fenno,	3 00
Native Grapes.—For the best Agawam, to C. E. Grant,	3 00
For the second best, to C. F. Holt,	2 00
For the best Catawba, to C. E. Grant,	3 00
For the best Concord, to N. Blanchard,	3 00
For the second best, to Cephas H. Brackett,	2 00
For the best Creveling, to B. G. Smith,	3 00
For the second best, to S. G. Damon,	2 00
For the best Diana, to Augustus Torrey,	3 00
For the second best, to J. F. Heustis,	2 00
For the best Iona, to Eben Snow,	3 00
For the second best, to S. G. Damon,	2 00
For the best Isabella, to J. V. Wellington,	3 00
For the second best, to W. T. Andrews,	2 00
For the best Wilder, to S. G. Damon,	3 00
For the second best, to Mrs. E. M. Gill,	2 00
For the best Massasoit, to S. G. Damon,	3 00
Foreign Grapes:—For the best three varieties, to E. W. Wood,	5 00
For the second best, to B. G. Smith,	4 00
For the best two bunches, to B. G. Smith,	3 00
For the second best, to E. W. Wood,	2 00
Quinces:—For the best, to Charles Bird,	3 00
For the second best, to W. S. Janvrin,	2 00
For the third best, to Mrs. S. Joyce,	1 00

Gratuities:—

To A. S. M'Intosh, for Pears,	2 00
Warren Fenno, " "	2 00
R. Manning, " "	2 00
Mrs. E. M. Gill, " "	1 00
S. A. Hall, " "	1 00

To Asa Bullard, for Pears,	$1 00
John L. Bird, " "	1 00
John McClure, " "	1 00
James Cruickshanks, for collection of Pears,	2 00
C. E. Grant, " " " "	2 00
J. C. Park, " " " "	2 00
Miss Sarah Story, " " " "	1 00
T. M. Davis, " " " "	1 00
Mrs. H. V. Draper, for Pears and Grapes,	2 00
S. N. Gaut, for Apples and Pears,	2 00
William C. Child, for Apples,	1 00
J. B. Moore, for Peaches,	1 00
C. D. Chamberlain, for Seedling Peaches,	1 00
Charles Leeds, for Seedling Peach,	1 00
B. G. Smith, for Foreign Grapes,	2 00
A. F. Rice, for Worden Grapes,	1 00

October 13.

Gratuities:—

To George E. Freeman, for Sheldon Pears,	2 00
William E. Coffin, for Glout Morceau Pears,	1 00
William G. Prescott, for Seedling Pear,	1 00
Joseph Gardner, for Beurre Diel Pears,	1 00
James Marble, for Gloria Mundi Apples,	1 00

October 20.

Gratuities:—

To C. E. Grant, for collection,	2 00
F. & L. Clapp, for collection of Seedling Pears,	5 00
I. G. Dearborn, for Peaches,	1 00

October 27.

Gratuities:—

To William G. Prescott, for Urbaniste Pears,	1 00
G. M. Mellen, for Beurre Bosc Pears,	1 00
H. M. Young, for collection,	1 00

November 3.

Gratuity:—

To M. Morse, for Doyenne du Comice Pears,	1 00

NOVEMBER 10.

PEARS.—For the best Beurre d'Anjou, to Alexander Dickinson,	$3 00
For the second best, to John McClure,	2 00
For the best Caen du France, to Marshall P. Wilder,	3 00
For the second best, to Hovey & Co.,	2 00
For the best Dana's Hovey, to A. S. M'Intosh,	3 00
For the second best, to Jesse Haley,	2 00
For the best Lawrence, to J. V. Wellington,	3 00
For the second best, to W. S. Janvrin,	2 00
For the best Mount Vernon, to Walker & Co.,	3 00
For the second best, to A. McDermott,	2 00
For the best Winter Nelis, to F. C. Clouston,	3 00
For the second best, to T. M. Davis,	2 00

French Premiums.

APPLES.—For the best Baldwin, to J. T. Foster,	3 00
For the second best, to Mrs. E. M. Gill,	2 00
For the best Hubbardston Nonsuch, to Josiah Crosby,	3 00
For the second best, to J. T. Foster,	2 00
For the best Roxbury Russet, to J. T. Foster,	3 00
For the second best, to S. N. Gaut,	2 00

Gratuities:—

To Miss A. C. Wheeler, for collection of Grapes,	1 00
C. E. Grant, for Catawba Grapes,	1 00
Horace Partridge, for Grapes,	1 00
Warren Fenno, for collection of Pears,	3 00
A. S. M'Intosh, " " " "	2 00
A. Dickinson, " " " "	2 00
Edwin A. Hall, for Pears,	1 00
Mrs. Edward E. Menton, for Glout Morceau Pears,	2 00
Marshall P. Wilder, for Emile d'Heyst Pears,	1 00
M. Morse, for Doyenne du Comice Pears,	1 00
John L. Bird, for Easter Beurre Pears,	1 00

NOVEMBER 24.

Gratuity:—

To Hovey & Co., for collection of Pears,	2 00

DECEMBER 1.

Gratuities:—

To C. E. Grant, for collection of Pears,	$2 00
Alexander Greenlaw, for Winter Nelis Pears,	2 00

DECEMBER 15.

Gratuities:—

To A. S. M'Intosh, for Glout Morceau Pears,	1 00
Mrs. H. V. Draper, for Columbia Pears,	1 00
F. & L. Clapp, for Seedling Pears, No. 17,	1 00

The amount awarded to each contributor is as follows:

Allen, Miss M. C.	$4	Crafts, William A.	$8
Ames, Philander	1	Crane, Joshua	3
Andrews, W. T.	7	Crosby, Josiah	13
Atkinson, C. M.	15	Cruickshanks, James	6
Austin, William R.	15	Cummings, John	3
Barnes, Parker	1	Curtin, Daniel	4
Bates, Amos	1	Damon, S. G.	28
Baxter, J. F.	2	Davenport, Edward	3
Bird, Charles	3	Davis, B. B.	3
Bird, John L.	13	Davis, T. M.	38
Blanchard, Nathan	7	Dearborn, I. G.	1
Bowers, H. C.	2	DeWolf, John L.	16
Brackett, Cephas H.	10	Dickinson, Alexander	52
Brackett, Charles N.	24	Dorr, George	8
Bullard, Asa	2	Draper, E. L.	3
Capen, Aaron D.	4	Draper, H. V.	1
Chadbourne, M. H.	3	Eaton, Horace	19
Chamberlain, C. D.	1	Esterbrook, John W.	4
Chase, Joseph S.	5	Falconer, John	23
Child, William C.	11	Fenno, J. H.	17
Clapp, F. & L.	28	Fenno, Warren	97
Clement, Asa	8	Fillebrown, John	10
Clouston, F. C.	3	Fletcher, Edwin	2
Coffin, William E.	1	Fobes, Mrs. Benjamin	3
Comley, James	9	Foster, J. T.	31
Cook, Henry	8	Freeman, George E.	2
Corey, Timothy	14	Frost, Stiles	19

Garfield, Charles	$25	Menton, Mrs. Edward E.	$2
Gaut, S. N.	14	Merriam, M. H.	1
Gill, Mrs. E. M.	12	Merrill, J. W.	2
Gilley, Frank M.	2	M'Intosh, A. S.	20
Grant, C. E.	67	Mitchell, Edward M.	1
Greenlaw, Alexander	2	Moore, J. B.	92
Hadwen, O. B.	15	Morse, M.	2
Haley, Jesse	16	Morton, I. A.	1
Hall, E. A.	1	Muldoon, M.	2
Hall, S. A.	1	Myrick, E.	4
Hall, W. T.	23	Newton, John C.	1
Hartwell, Samuel	8	Nichols, Mrs. F.	1
Harwood, George S.	17	Nickerson, Amos	1
Heustis, J. F.	2	Nickerson, J. F.	12
Heustis, Warren	6	Nugent, James	8
Hill, George	14	Oliver, Isaac	4
Holt, C. F.	2	Park, John C.	30
Horner, Mrs. C. N. S.	2	Parker, Augustus	13
Hovey & Co.	62	Parker, Joseph	4
Hovey, J. Dana	2	Partridge, Horace	14
Hunt, B. F.	5	Prescott, William G.	7
Hyde, Edward	3	Rice, A. F.	1
Janvrin, W. S.	17	Richardson, E. P.	17
Johnson, Dr. C. H.	1	Rogers, George H.	1
Joyce, Mrs. S.	1	Russell, Walter	15
Kendrick, Mrs. H. P.	9	Shattuck, F. R.	1
Kingman, C. D.	9	Slack, Lewis	4
Langmaid, S. P.	17	Smith, B. G.	77
Langworthy, I. P.	4	Smith, Peter	16
Leeds, Charles	1	Snow, Eben	6
Lockwood, T. S.	6	Stearns, Charles	5
Lothrop, D. W.	1	Stowers, D. W.	1
Luke, E. H.	6	Sullivan, J. L. D.	2
Manning, Robert	6	Talbot, J. W.	6
Mansfield, H. S.	15	Torrey, Augustus	2
Marble, James	1	Walker & Co.	15
McClure, John	17	Walker, Wm. P.	26
McDermott, A.	8	Wall, Charles H.	8
Mellen, G. M.	19	Ware, Benjamin P.	2

Waters, George F. . .	$1	Wilder, Marshall P. .	$33
Wellington, J. V. . .	9	Wood, E. W. . . .	15
Weston, C. L. . .	5	Wood, W. K. . . .	3
Wheeler, Miss A. C. .	5	Young, H. M. . .	2
White, N. B. . . .	1		

Amount of appropriation, ...		$1,900
Prizes awarded, ...	$1,228	
Prospective Prize, to John B. Moore, . .	60	
Gratuities awarded, ...	336	
		1,624
Balance not awarded, ...		$276

REPORT

OF THE

Committee on Vegetables,

FOR THE YEAR 1877.

By C. N. BRACKETT, Chairman.

The Committee on Vegetables for the year 1877 report as follows:

The past season has been remarkably favorable for the production of fine vegetables. The various crops have been abundant, and the quality excellent.

With such a season and such crops we naturally look for corresponding results at our exhibitions, not only in the increased quantity and variety of the various specimens offered for competition, but also in their quality and improvement generally. In other words, a favorable season means a good exhibition season. So far as this department is concerned this expectation has been realized, and our shows of vegetables have been among the best ever made. From the commencement of the year to the opening exhibition, on the 7th of April, there were occasionally some very fine specimens of forced vegetables placed on exhibition in the Library Room, as has been the case in former years. These contributions, although limited in quantity in comparison with those of some previous years, nevertheless comprised the choicest specimens of the season, and furnished ample proof of care and skill in cultivation.

During the months of January, February, and March, we were indebted to the following contributors, to whom gratuities were awarded for the objects named: to Josiah Crosby, for Celery, Lettuce, Dandelions, Radishes, and Cucumbers; to Hovey & Co., for Mushrooms; to C. M. Atkinson, for Brussells Sprouts, Swiss

Chard, and Cauliflowers; to Cephas H. Brackett, for very fine specimens of Cucumbers, Mushrooms, and Rhubarb; to James Comley, for several varieties of Tomatoes, the first shown March 3, and continued at intervals up to June 20; to Walter Russell, for Lettuce, Cucumbers, and Radishes; to W. D. Philbrick, George Hill, George F. Stone, and George W. Pierce, for well grown specimens of Tennisball Lettuce.

The weekly shows, commencing April 7, have all been fine, many of them unusually so. Those of June 2d and 27th may be mentioned as among the best of the season. June 9, Mr. Levi Emery exhibited specimens of Victoria Rhubarb, a single stalk of which weighed 2 lbs. 11½ ozs. James Comley also had on exhibition, at this date, three varieties of Tomatoes, and George Dorr very fine samples of Princess Head Lettuce.

The show of Peas, during their season, was considered much superior to what we have usually seen in former years. The same remark will apply to Lima Beans, which have never before been shown in such perfection as during the past season. The first prize for this favorite bean, both at the weekly and annual shows, has invariably been taken by Benjamin G. Smith. In every case, however, competition has been spirited, and the prizes have been very closely contested. At the Annual Exhibition the number of competitors for this prize was twelve.

July 14, Joseph Tailby exhibited a new Pea, grown by him from seed received from Carter & Co., of London, under the name of Commander-in-Chief. It is an attractive variety, the pods being large and well filled, and is said to be very productive and of superior quality. It is considered promising, and is recommended for trial.

Notwithstanding the ravages of the Potato Beetle the past season, the potato crop has generally been abundant, of excellent quality, and far superior in all respects to the average of the past few years. At the Annual Exhibition the show of this esculent was thought to be one of the best ever made in the Hall. There were on exhibition at this time fifty-nine dishes, consisting mainly of the following varieties: Early Rose, Extra Early Vermont, Snow Flake, Brownell's Beauty, Jackson, Early Ohio, Bresee's Prolific, and Eureka. The largest contributors were Mrs. M. T. Goddard and John Cummings, the former taking the first prize for the best four varieties, and the latter all but one of the first prizes for the best

single dishes. The prize for the best collection of new seedlings was not awarded.

The first exhibition of Tomatoes of open culture was made on the 21st of July by Walter Russell, and the last on the 10th of November by C. E. Grant; the display in the interval between those dates having been varied in kind, profuse in quantity, and excellent quality. At the Annual Exhibition this favorite vegetable was largely represented, there being no less than seventy-three dishes of the finest specimens ever seen on our table at this season. Our space will not allow us to speak of all the varieties that were shown, or to give the names of the contributors; most of the varieties of recent introduction have already been spoken of in previous reports. The varieties most extensively cultivated are Boston Market, Gen. Grant, and Emery, and these have invariably taken the first prizes at all the exhibitions during the season.

Cauliflowers were not as fine as last year; the best were shown by John B. Moore and John Cummings.

At the Annual Exhibition the Squash family was well represented, aud the show was pronounced the best ever made of this important vegetable. Seth W. Hathaway was awarded the first prizes for Marrow, Hubbard, Turban, and Marblehead.

The displays of Melons, Egg Plant, etc., were all remarkably full and fine. Of the different varieties of the Onion there were, on exhibition, forty-two dishes, each dish containing one peck. The first prize for the best three varieties was awarded to J. B. Moore.

At this exhibition J. J. H. Gregory showed a fine collection of Watermelons, his specimens of Haskell's Excelsior and Vick's Early taking the first and third prizes; the Mountain Sweet, exhibited by Mrs. M. T. Goddard taking the second. Good specimens of Phinney's Early were also shown by the same contributors. The Greenflesh varieties, shown by Walter Russell, J. B. Moore, and others, were also very good, considering the lateness of the season.

No special comments on the exhibition of the various root crops, — Beets, Parsnips, Carrots, etc.,—are deemed necessary; the displays have been as abundant in quantity and as satisfactory in quality as usual.

We would again caution competitors for the Society's prizes, against deviating from the conditions specified in the Schedule. All varieties should be correctly named, and should contain the

required number of specimens named in the Schedule,—no more and no less. Any deviation from these or other established rules disqualifies the contribution, and it becomes the duty of the Committee to reject such collections, no matter how meritorious they may otherwise be. As this disagreeable duty was several times imposed on your Committee during the past season, they desire to bring this subject particularly to the notice of contributors, that the mistake may not be repeated in future.

The attention of contributors is called to important changes and alterations in the Schedule of Prizes for the coming year. It will be seen, on referring to the Schedule, that the appropriation for prizes and gratuities for vegetables has again been reduced, the amount for the coming year being fixed at $750, a reduction of twenty-five per cent. from the present year.

In order to keep within the appropriation, the Committee, in making up the Schedule for 1878, have not only found it necessary to cut down most of the prizes from what they were the present year, but have also been obliged to drop the November exhibition entirely. This is of course to be regretted, but as the interests of the Society appear to demand it, and as it is believed to be but temporary, it is earnestly hoped that contributors will not allow their interest in our exhibitions to flag on this account, but will cheerfully acquiesce in a measure necessary to what every member should have at heart—the best interests of the Society.

We close our report with the following list of prizes and gratuities awarded by your Committee the past season.

All of which is respectfully submitted.

C. N. Brackett,
Walter Russell,
George W. Pierce,
J. Fillebrown,
Josiah Crosby,
Anthony Hatch,
Samuel Hartwell,
} *Vegetable Committee.*

PRIZES AND GRATUITIES FOR VEGETABLES.

JANUARY 6.

Gratuity:—

To Josiah Crosby, for Celery, ... $1 00

JANUARY 20.

Gratuity:—

To Hovey & Co., for Mushrooms, ... 1 00

JANUARY 27.

Gratuity:—

To W. D. Philbrick, for Lettuce, ... 2 00

FEBRUARY 3.

Gratuities:—

To C. M. Atkinson, for Brussells Sprouts, . . . 2 00
W. D. Philbrick, for Lettuce, ... 1 00

FEBRUARY 10.

Gratuity:—

To C. M. Atkinson, for collection, ... 3 00

FEBRUARY 17.

Gratuity:—

To Josiah Crosby, for Lettuce, ... 2 00

FEBRUARY 24.

Gratuities:—

To George W. Pierce, for Lettuce, ... 2 00
Josiah Crosby, " " 1 00

MARCH 3.

Gratuities:—

To Josiah Crosby, for collection, ... 2 00
George W. Pierce, for Lettuce, ... 1 00

To Cephas H. Brackett, for Mushrooms and Cucumbers, $4 00
James Comley for Tomatoes, ... 1 00
Walter Russell, for two varieties of Radishes, . . 2 00

MARCH 10.

Gratuities:—

To C. H. Brackett, for Cucumbers, Mushrooms, and Rhubarb, ... 3 00
Walter Russell, for Radishes, ... 1 00

MARCH 24.

Gratuities:—

To Josiah Crosby, for Lettuce and Radishes, . . 2 00
Walter Russell, " " " " . . . 2 00
George Hill, for Lettuce, ... 1 00
James Comley, for One Hundred Days Tomato (new), . 2 00
C. M. Atkinson, for Spinach and Rhubarb, . . 2 00

AZALEA EXHIBITION.

APRIL 7.

CUCUMBERS.—For the best pair, to James Bard, . . 4 00
For the second best, to C. H. Brackett, . . . 3 00
LETTUCE.—For the best four heads of Tennisball, to G. F. Stone, ... 4 00
For the second best, to C. Garfield, . . . 3 00
For the third best, to W. T. Andrews, . . . 2 00
RADISHES.—For the best four bunches of Long Scarlet, to George Hill, ... 3 00
PARSLEY.—For the best dish of two quarts, to George Hill, 3 00

Gratuities:—

To James Comley, for three varieties of Tomatoes: Gen. Grant, Boston Market, and One Hundred Days, 2 00
C. H. Brackett, for Mushrooms, ... 1 00
C. M. Atkinson, for Brussels Sprouts, . . . 1 00

APRIL 14.

Gratuity:—

To C. H. Brackett, for Cucumbers, ... 1 00

APRIL 28.

Gratuities:—

To Walter Russell, for collection. $2 00
C. H. Brackett, for Cucumbers, ... 1 00

MAY 5.

Gratuities:—

To James Comley, for Tomatoes and Rhubarb, . . 3 00
Walter Russell for Radishes and Dandelions, . . 2 00

MAY 12.

Gratuities:—

To J. H. Bell, for Tennisball Lettuce (fine), . . . 1 00
James Comley, for Tomatoes, ... 1 00

MAY 19.

Gratuities:—

To John B. Moore, for Asparagus (fine). . . . 2 00
Samuel Hartwell, for Asparagus and Rhubarb, . . 2 00
Alexander Anderson, for Rhubarb, ... 1 00
George Dorr, for Rhubarb, ... 1 00
James Comley, for Tomatoes, ... 1 00

MAY 26.

Gratuities:—

To James Comley, for three varieties of Tomatoes, . 2 00
Alexander Anderson, for Victoria Rhubarb, . . 1 00

JUNE 2.

ASPARAGUS.—For the best four bunches, to J. B. Moore, 4 00
For the second best, to Samuel Hartwell, . . 3 00
For the third best, to L. W. Weston, . . . 2 00
CUCUMBERS.—For the best pair, to Josiah Crosby, . . 3 00
For the second best, to George Hill, . . . 2 00
For the third best, to C. H. Brackett, . . . 1 00
RHUBARB.—For the best twelve stalks, to Alexander Dickinson (17½ lbs.), ... 3 00
For the second best, to Samuel Hartwell (15 lbs.), . 2 00
For the third best, to L. W. Weston, . . . 1 00

Radishes.—For the best Long Scarlet, to Josiah Crosby,	$3 00
For the second best, to Walter Russell, . . .	2 00
For the best Turnip Rooted, to Walter Russell, . .	3 00
Lettuce.—For the best four heads, to George Hill, .	3 00
For the second best, to Josiah Crosby, . . .	2 00
For the third best, to C. M. Atkinson, . . .	1 00
For the best four heads of Boston Curled, to George Hill, ...	3 00
For the second best, to Josiah Crosby, . . .	2 00
Carrots.—For the best twelve Short Scarlet, to Josiah Crosby, ...	4 00

Gratuities:—

To William G. Prescott, for Rhubarb, ...	1 00
James Comley, for two varieties of Tomatoes, . .	1 00
Walter Russell, for French Breakfast Radishes, . .	1 00

June 9.

Gratuities:—

To George Dorr, for Princess Head Lettuce, . . .	1 00
C. M. Atkinson, for Lettuce, ...	1 00
Levi Emery, for Victoria Rhubarb, (weight of largest stalk, 2 lbs. 11½ ounces), ...	1 00
James Comley, for three varieties of Tomatoes, .	1 00
C. N. Brackett, for Dunnett's Triple Curled Parsley, .	1 00
A. S. M'Intosh, for Artichokes, ...	1 00

June 16.

Gratuities:—

To John B. Moore, for Alpha Peas, ...	1 00
C. E. Grant, for Philadelphia Extra Early Peas, .	1 00
M. W. Chadbourne, for Alpha and Caractacus Peas, .	2 00

June 20.

Gratuities:—

To Josiah Crosby, for collection of Vegetables, . .	3 00
Cephas H. Brackett, for Cucumbers, . . .	1 00
L. W. Weston, for Peas, ...	1 00
C. E. Grant, for Caractacus Peas, ...	1 00
M. W. Chadbourne, for Little Gem and other Peas, .	2 00

To Samuel Hartwell, for Asparagus and Peas, . . $2 00
C. D. Kingman, for Alpha Potatoes, . . . 2 00
James Comley, for Tomatoes, ... 1 00

JUNE 23.

Gratuities:—

To M. W. Chadbourne, for Advancer Peas, . . . 1 00
George Dorr, for very fine Lettuce, ... 1 00

STRAWBERRY SHOW.

JUNE 27.

PEAS.—For the best peck, to J. H. Bell, for Advancer, . $4 00
For the second best, to M. W. Chadbourne, for Advancer, ... 3 00
For the third best, to Samuel Hartwell, for Marrowfat, 2 00
BEETS.—For the best Turnip Rooted, to Walter Russell, for Dewing's, ... 3 00
For the second best, to Josiah Crosby, for Dewing's, 3 00
For the best Egyptian, to Josiah Crosby, . . . 4 00
CUCUMBERS.—For the best pair, to Josiah Crosby, for White Spine, ... 4 00
For the second best, to Walter Russell, for White Spine, ... 3 00
For the third best, to George Hill, for White Spine, 2 00
LETTUCE.—For the best of any variety, to George Dorr, for Royal Cape, ... 4 00
For the second best, to Josiah Crosby, for Tennisball, 3 00
For the third best, to J. H. Bell, for Black Seeded Tennisball, ... 2 00
CARROTS.—For the best twelve Short Scarlet, to Josiah Crosby, ... 4 00
For the best Intermediate, to Josiah Crosby, . . 3 00
For the second best, to Walter Russell, . . . 2 00
ONIONS.—For the best twelve, to Josiah Crosby, . . 4 00

Gratuities:—

To C. E. Grant, for collection of Peas, ... 1 00
J. H. Bell, for Long Warted Squashes, . . . 1 00
Walter Russell, for Parsley, ... 1 00

July 7.

Cranberry Beans.—For the best peck, to Josiah Crosby,	$4 00
For the second best, to Walter Russell, . . .	3 00
For the third best, to Walter Russell, . . .	2 00
Squashes.—For the best four Summer, to George Hill, .	3 00
For the second best, to Walter Russell, . . .	2 00
Peas.—For the best peck, to C. M. Atkinson, for Champion, ...	4 00
For the second best, to S. Hartwell, for Marrowfat,	3 00
For the third best, to L. W. Weston, " "	2 00
Onions.—For the best twelve, to Josiah Crosby, for White Portugal, ...	3 00
For the second best, to George Hill, for White Portugal, ...	2 00
For the third best, to C. M. Atkinson, for Potato, .	1 00
Potatoes.—For the best peck, to M. W. Chadbourne, for Early Rose, ...	4 00
For the second best, to C. D. Kingman, for Alpha, .	3 00
Cabbages.—For the best four, to Josiah Crosby, for Wyman, ...	4 00
For the second best, to Walter Russell, for Wyman,	3 00
For the third best, to Josiah Crosby, for Wakefield,	2 00

Gratuities:—

To C. D. Kingman for Wax Beans, ...	1 00
Walter Russell, for Beets, ...	1 00
" " for collection of Beans, . . .	2 00
J. H. Bell, for collection, ...	2 00

July 14.

Potatoes.—For the best peck, to John B. Moore, for Early Rose, ...	4 00
For the second best, to J. H. Bell, for Early Rose, .	3 00
For the third best, to Warren Heustis, . . .	2 00

Gratuities:—

To Joseph Tailby, for Commander-in-Chief Peas, . .	2 00
L. W. Weston, for Laxton's Late Peas, . . .	1 00

To M. W. Chadbourne, for collection, ... $1 00
Charles Garfield, " " 1 00
Josiah Crosby, " " 1 00
J. H. Bell, for Parsley, ... 1 00

JULY 21.

SWEET CORN.—For the best twelve ears, to W. C. Child, 4 00
For the second best, to C. E. Grant, for Crosby, . 3 00
For the third best, to C. E. Grant, for Tom Thumb, 2 00
SQUASHES.—For the best four Marrow, to Josiah Crosby, 4 00
CABBAGES.—For the best Drumhead, to George Hill, . 4 00
For the second best, to Walter Russell, . . . 3 00
BEANS.—For the best peck of Dwarf Horticultural, to Walter Russell, ... 3 00
TOMATOES.—For the best twelve, to Walter Russell, for Boston Market, ... 3 00

Gratuity:—

To E. W. Wood, for Tom Thumb Corn, . . . 1 00

JULY 28.

TOMATOES.—For the best twelve, to C. N. Brackett, for Emery, ... 4 00
For the second best, to George Hill, for Emery, . 3 00
For the third best, to C. N. Brackett, for Gen. Grant, 2 00
For the fourth best, to Walter Russell, " " " 1 00
SWEET CORN.—For the best twelve ears, to Josiah Crosby, for Crosby, ... 4 00
For the second best, to Walter Russell, for Crosby, 3 00
For the third best, to C. N. Brackett, " " 2 00
EGG PLANT.—For the best Black Pekin, to James Bard, . 4 00
Third prize, to Josiah Crosby, ... 2 00

Gratuities:—

To J. H. Bell, for Early Rose Potatoes, . . . 1 00
Mrs. E. M. Gill, for collection of Beans, . . . 1 00
John Cummings, for Boston Market Tomatoes, . 1 00
C. D. Kingman, for Tomatoes, ... 1 00
Walter Russell, for Cabbages, ... 1 00
M. W. Chadbourne, for collection, ... 1 00

August 4.

Squashes.—For the best four Marrow, to Josiah Crosby,	$4 00
For the second best, to George Hill, . . .	3 00
Sweet Corn.—For the best twelve ears, to Walter Russell,	4 00
For the second best, to J. H. Bell, ...	3 00
For the third best, to Samuel Hartwell, . . .	2 00
Tomatoes.—For the best twelve specimens of Gen. Grant, to C. N. Brackett, ...	3 00
For the second best, to George Hill, . . .	2 00
For the third best, to J. B. Moore, ...	1 00
For the best Boston Market, to John Cummings, .	3 00
For the second best, to J. B. Moore, . . .	2 00
For the third best, to G. M. Mellen, . . .	1 00
For the best of any other variety, to C. N. Brackett, for Emery, ...	3 00
For the second best, to R. W. Ames, for Paragon, .	2 00
For the third best, to J. B. Moore, for Canada Victor,	1 00

Gratuities:—

To Walter Russell, for Purple Egg Plant, . . .	2 00
J. H. Bell, for Cabbages and Peppers, . . .	1 00
C. E. Grant, for Lima Beans, ...	1 00

August 11.

Egg Plant.—For the best four specimens of Black Pekin, to J. Bard, ...	3 00
For the best four specimens of Large Round Purple, to W. Russell, ...	4 00
Greenflesh Melons.—For four specimens, the second prize, to Walter Russell, ...	3 00
Tomatoes.—For the best twelve, of any variety, to C. N. Brackett, for Gen. Grant, ...	3 00
For the second best, to John Cummings, for Paragon,	2 00
For the third best, to C. N. Brackett, for Emery, .	1 00
Beans.—For the best two quarts of Large Lima, to B. G. Smith, ...	4 00
For the second best, to C. E. Grant, . . .	3 00
For the third best, to W. C. Child, ...	2 00

Gratuities:—

To John B. Moore, for collection, ... $3 00
Walter Russell, " " 2 00
John Cummings, for three varieties of Tomatoes, . 2 00
Samuel Hartwell, for Burr's Corn, ... 1 00
C. N. Brackett, for Triumph Corn, ... 1 00

AUGUST 18.

GREENFLESH MELONS.—For the best four specimens of any variety, to Walter Russell, ... 3 00
PURPLE EGG PLANT.—For the best four specimens, to Walter Russell, ... 3 00
For the second best, to Josiah Crosby, . . . 2 00

Gratuities:—

To Josiah Crosby, for Pekin Egg Plant, . . . 1 00
James Comley, for Corn, ... 1 00
Walter Russell, " " 1 00
G. M. Mellen, for collection, ... 1 00
John Cummings, for collection of Tomatoes, . . 3 00
Benjamin G. Smith, for Sieva Beans, . . . 1 00
W. C. Child, for Lima Beans, ... 1 00

AUGUST 25.

POTATOES.—For the best peck of any variety, to J. Cummings, for Early Rose, ... 3 00
For the second best, to John B. Moore, for Early Rose, 2 00
For the third best, to J. H. Bell, for Early Rose, . 1 00
LIMA BEANS.—For the best two quarts, to B. G. Smith, 3 00
For the second best, to John B. Moore, . . . 2 00
For the third best, to Samuel G. Stone, . . . 1 00
PEPPERS.—For the best twelve specimens, to James Bard, 3 00
For the second best, to Walter Russell, . . . 2 00
For the third best, to J. H. Bell, ... 1 00

Gratuities:—

To W. C. Child, for collection of Beans, . . . 1 00
M. W. Chadbourne, for collection, ... 1 00
Walter Russell, " " 1 00
C. E. Grant, " " 1 00
John Cummings " " 1 00
Horace Partridge, for Potatoes, ... 1 00

SEPTEMBER 1.

LIMA BEANS.—For the best two quarts, to B. G. Smith, .	$3 00
For the second best, to J. B. Moore, . . .	2 00
For the third best, to C. E. Grant, ...	1 00
WATERMELONS.—For the best pair, to Isaac P. Dickinson,	4 00
For the second best, to Samuel Hartwell, for Mountain Sweet, ...	3 00
For the third best, to Samuel Hartwell, for Black Spanish, ...	2 00
GREENFLESH MELONS.—For the best four specimens, to John B. Moore, ...	3 00
For the second best, to J. H. Bell, ...	2 00
For the third best, to W. Russell, ...	1 00
CELERY.—For the best four roots, to Josiah Crosby, .	4 00
For the second best, to George Hill, . . .	3 00
PEPPERS.—For the best twelve specimens, to C. N. Brackett, ...	3 00
For the second best, to Walter Russell, . . .	2 00

Gratuities:—

To James Comley, for two varieties of Turnips, . .	2 00
Daniel Duffley, for collection of Egg Plants, . .	2 00
M. W. Chadbourne, for collection, ...	1 00
Mrs. E. M. Gill, " "	2 00
C. E. Grant, " "	1 00
Walter Russell, for Salsify and Corn, . . .	1 00

SEPTEMBER 8.

CELERY.—For the best four roots, to Josiah Crosby, .	4 00
SALSIFY.—For the best twelve specimens, to John Cummings, ...	3 00
For the second best, to Walter Russell, . . .	2 00
For the third best, to M. W. Chadbourne, . .	1 00
CAULIFLOWERS.—For the best four specimens, to J. B. Moore, ...	4 00

Gratuities:—

To Lewis Slack, for Canada Squashes, ...	1 00
John Cummings, for Sweet Corn, ...	1 00
Samuel Hartwell, for Parsley, ...	1 00

To D. R. Beckford, Jr., for collection, ...	$1 00
C. E. Grant, " "	2 00
C. N. Brackett, " "	1 00
Mrs. C. N. S. Horner, for collection of Beans, . .	1 00

ANNUAL EXHIBITION.

September 18, 19, 20, and 21.

Beets.—For the best Turnip Rooted, to George F. Stone,	$4 00
For the second best, to Walter Russell, . . .	3 00
For the third best, to John Fillebrown, . . .	2 00
Carrots.—For the best Long Orange, to Walter Russell,	3 00
For the second best, to Josiah Crosby, . . .	2 00
For the third best, to W. W. Rawson, . . .	1 00
For the best Intermediate, to Josiah Crosby, . .	3 00
For the second best, to Walter Russell, . . .	2 00
For the third best, to George Russell, . . .	1 00
Corn.—For the best Sweet, to George Dorr, . .	4 00
For the second best, to Samuel G. Stone, . .	3 00
For the third best, to Samuel Hartwell, . . .	2 00
For the best Field Corn, to Mrs. M. T. Goddard, .	4 00
For the second best, to C. N. Brackett, . . .	3 00
For the third best, to Horace Eaton, . . .	2 00
Cauliflowers.—For the best four specimens, to J. B. Moore, ...	4 00
For the second best, to John Cummings, . .	3 00
Celery.—For the best four roots, to Josiah Crosby, .	4 00
For the second best, to George Hill, . . .	3 00
For the third best, to John Fillebrown, . . .	2 00
Tomatoes.—For the best three varieties, to J. Cummings,	5 00
For the second best, to J. Cummings, . . .	4 00
For the third best, to Walter Russell, . . .	3 00
For the best Arlington, to J. Cummings, . . .	3 00
For the best Boston Market, to J. Cummings, . .	3 00
For the best Emery, to J. J. H. Gregory, . . .	3 00
For the best Gen. Grant, to C. E. Grant, . . .	3 00
For the best of any other variety, to J. J. H. Gregory, for Paragon, ...	3 00
Okra.—For the best twenty-four specimens, to Mrs. M. T. Goddard, ...	3 00

Martynias.—For the best twenty-four specimens, to Walter Russell,	$3 00
For the second best, to G. W. Pierce,	2 00
For the third best, to J. H. Bell,	1 00
Cranberries.—For the best half-peck, to A. T. Brown,	4 00
For the second best, to C. N. Brackett,	3 00
Greenflesh Melons.—For the best four specimens, to Walter Russell,	4 00
For the second best, to J. B. Moore,	3 00
For the third best, to George F. Stone,	2 00
Muskmelons.—For the best four specimens, to J. H. Bell,	4 00
For the second best, to S. A. Merrill,	3 00
Watermelons.—For the best pair, to J. J. H. Gregory,	4 00
For the second best, to Mrs. M. T. Goddard,	3 00
For the third best, to J. J. H. Gregory,	2 00
Beans.—For the best two quarts of Large Lima, to B. G. Smith,	4 00
For the second best, to George Hill,	3 00
For the third best, to C. E. Grant,	2 00
Parsnips.—For the best twelve specimens, to J. L. DeWolf,	4 00
For the second best, to W. A. Crafts,	3 00
For the third best, to W. W. Rawson,	2 00
Potatoes.—For the best four varieties, to Mrs. M. T. Goddard,	5 00
For the second best, to John Cummings,	4 00
For the third best, to John Cummings,	3 00
For the best peck of Bresee's Prolific, to J. Cummings,	2 00
For the best Brownell's Beauty, to J. Cummings,	2 00
For the second best, to Walter Russell,	1 00
For the best Early Rose, to J. Cummings,	2 00
For the second best, to J. B. Moore,	1 00
For the best Jackson, to C. N. Brackett,	2 00
For the second best, to John Cummings,	1 00
For the best Snow Flake, to John Cummings,	2 00
For the second best, to John L. DeWolf,	1 00
For the best peck of any other variety, to J. Cummings, for Eureka,	2 00
For the second best, to Mrs. M. T. Goddard, for Hardy's Seedling,	1 00

Salsify.—For the best twelve specimens, to J. L. DeWolf,	$4 00
For the second best, to W. A. Crafts,	3 00
For the third best, to Walter Russell,	2 00
Squashes.—For the best four Canada, to Josiah Pratt,	4 00
For the second best, to George Dorr,	3 00
For the third best, to C. C. Calder,	2 00
For the best four Hubbard, to S. W. Hathaway,	4 00
For the second best, to J. J. H. Gregory,	3 00
For the third best, to Walter Russell,	2 00
For the best four Marrow, to S. W. Hathaway,	4 00
For the second best, to John Fillebrown,	3 00
For the third best, to George Hill,	2 00
For the best four Marblehead, to S. W. Hathaway,	4 00
For the second best, to J. J. H. Gregory,	3 00
For the third best, to John Cummings,	2 00
For the best four Turban, to S. W. Hathaway,	4 00
For the second best, to John Fillebrown,	3 00
For the third best, to J. J. H. Gregory,	2 00
Turnips.—For the best twelve specimens, to Anthony Hatch,	3 00
For the second best, to George Russell,	2 00
For the third best, to Walter Russell,	1 00
For the best twelve Swedish Turnips, to J. Comley,	3 00
For the second best, to Mrs. M. T. Goddard,	2 00
Cabbages.—For the best four Drumhead, to Seth W. Hathaway,	4 00
For the second best, to John Cummings,	3 00
For the third best, to J. B. Tilley,	2 00
For the best Red, to J. Cummings,	4 00
For the second best, to Anthony Hatch,	3 00
For the third best, to Timothy Corey,	2 00
For the best three Savoy, to J. Cummings,	4 00
For the second best, to Walter Russell,	3 00
For the third best, to George Russell,	2 00
Peppers.—For the best twenty-four specimens, to G. F. Stone,	4 00
For the second best, to C. N. Brackett,	3 00
For the third best, to J. H. Bell,	2 00
Onions.—For the best peck, to John Cummings,	3 00

For the second best, to John B. Moore,	$2 00
For the third best, to George Hill,	1 00
For the best three varieties, to John B. Moore,	5 00
For the second best, to Samuel Hartwell,	4 00
For the third best, to George Hill,	3 00
Egg Plant.—For the best Black Pekin, to George W. Pierce,	4 00
For the second best, to Josiah Crosby,	3 00
For the third best, to John Cummings,	2 00
For the best Round Purple, to Walter Russell,	4 00
For the second best, to George Russell,	3 00
For the third best, to George Hill,	2 00
Endive.—For the best four specimens, to Walter Russell,	3 00
Horseradish.—For the best six roots, to John Fillebrown,	4 00
For the second best, to Walter Russell,	3 00
For the the third best, to W. W. Rawson,	2 00

Gratuities:—

To L. P. Boothby, for Jay's Seedling Potato,	1 00
M. W. Chadbourne, for Squash,	1 00
Samuel Hartwell, for Parsley,	1 00
J. H. Bell, " "	1 00
Walter Russell, " "	1 00
John Cummings, for Pumpkins,	1 00
A. T. Brown, " "	1 00
Samuel Hartwell, for Watermelons,	1 00
J. H. Bell, for Melons,	1 00
J. J. H. Gregory, for collection of Potatoes,	3 00
Harry L. Rand, " " " Gourds,	3 00
W. P. Walker, " " " "	1 00
Louis Prang, " " " "	1 00
J. J. H. Gregory, " " " Tomatoes,	1 00
James Comley, " " " Turnips,	2 00
" " " "	5 00
G. M. Mellen, " "	1 00
D. R. Beckford, Jr., " "	1 00
John Fillebrown, " "	1 00

SEPTEMBER 29.

Gratuities: —

To C. E. Grant, for collection, ... $2 00
C. N. Brackett, for Sweet Corn, ... 1 00

OCTOBER 6.

CAULIFLOWERS.—For the best four specimens, to John B. Moore, ... 4 00
For the second best, to John Cummings, . . 3 00
For the third best, to M. W. Chadbourne, . . 2 00
CELERY.—For the best four roots, to Josiah Crosby, . 4 00
For the second best, to John Fillebrown, . . 3 00
CABBAGES.—For the best three Drumhead, to J. Cummings, ... 3 00
For the best Red, to J. Cummings, ... 3 00
For the best Savoy, to J. Cummings, ... 3 00
SALSIFY.—For the best twelve specimens, to Josiah Crosby, 3 00
HORSERADISH.—For the best six roots, to John Fillebrown, 3 00

Gratuities:—

To Samuel G. Stone, for Lima Beans and Corn, . . 2 00
Samuel Hartwell, for Lima Beans, ... 1 00
John Cummings, for collection of Squashes, . . 1 00
D. R. Beckford, Jr., for collection, ... 1 00
C. E. Grant, " " 1 00
C. N. Brackett, " " 1 00

OCTOBER 13.

Gratuity: —

To Samuel G. Stone, for collection, ... 1 00

NOVEMBER 3.

Gratuity:—

To Josiah Crosby, for Celery and Cauliflowers, . . 2 00

NOVEMBER 10.

CAULIFLOWERS. — For the best four specimens, to Josiah Crosby, ... 4 00
For the second best, to John Cummings, . . 3 00

Celery.—For the best four roots, to Josiah Crosby,	$4 00
For the second best, to J. Fillebrown,	3 00
Cabbages.—For the best Red, three specimens, to John Cummings,	3 00
For the best Savoy, to J. Fillebrown,	3 00
For the second best, to John Cummings,	2 00

Gratuity:—

To A. S. M'Intosh, for Artichokes,	1 00

December 15.

Gratuity:—

To W. D. Philbrick, for Lettuce,	1 00

The amount awarded to each contributor is as follows:

Ames, R. W.	$2 00	Garfield, Charles	$4 00
Anderson, Alexander	2 00	Gill, Mrs. E. M.	3 00
Andrews, W. T.	2 00	Goddard, Mrs. M. T.	18 00
Atkinson, C. M.	15 00	Grant, C. E.	25 00
Bard, James	14 00	Gregory, J. J. H.	24 00
Beckford, D. R., Jr.	3 00	Hartwell, Samuel	32 00
Bell, J. H.	32 00	Hatch, Anthony	6 00
Boothby, L. P.	1 00	Hathaway, S. W.	20 00
Brackett, C. H.	15 00	Heustis, Warren	2 00
Brackett, C. N.	37 00	Hill, George	51 00
Brown, A. T.	5 00	Horner, Mrs. C. N. S.	1 00
Calder, C. C.	2 00	Hovey & Co.	1 00
Chadbourne, M. W.	20 00	Kingman, C. D.	7 00
Child, W. C.	8 00	Mellen, G. M.	3 00
Comley, James,	28 00	Merrill, S. A.	3 00
Corey, Timothy	2 00	M'Intosh, A. S.	2 00
Crafts, W. A.	6 00	Moore, J. B.	50 00
Crosby, Josiah	118 00	Partridge, H.	1 00
Cummings, J.	95 00	Philbrick, W. D.	41 00
DeWolf, J. L.	9 00	Pierce, G. W.	9 00
Dickinson, Alexander	3 00	Prang, Louis	1 00
Dorr, George	14 00	Pratt, Josiah	4 00
Duffley, Daniel	2 00	Prescott, W. G.	1 00
Eaton, Horace	2 00	Rand, Harry L.	2 00
Emery, Levi	1 00	Rawson, W. W.	5 00
Fillebrown, John	27 00	Russell, George	8 00

Russell, Walter	$121 00	Tailby, Joseph	$2 00
Slack, Lewis	1 00	Tilley, J. B.	2 00
Smith, Benj. G.	15 00	Walker, W. P.	1 00
Stone, G. F.	14 00	Weston, L. W.	7 00
Stone, S. G.	8 00	Wood, E. W.	1 00

Amount of Appropriation,		$1,000 00
Awarded in Prizes,	$728 00	
Awarded in Gratuities,	200 00	
Total amount of Awards,		928 00
Amount of Appropriation unexpended,		$72 00

REPORT

OF THE

COMMITTEE ON GARDENS,

FOR THE YEAR 1877.

BY JOSEPH H. WOODFORD, CHAIRMAN.

The Garden Committee received the following applications to visit places during the year, viz.:

One from Henry Youell, gardener at the City Hospital, of Boston, to inspect the flower garden connected with that institution.

One from Henry Ross, Superintendent of the Newton Cemetery, to inspect that Cemetery.

One from Francis B. Hayes, of Lexington, to inspect his estate, entered for the Hunnewell Triennial Prize.

One from John Falconer, gardener to Mrs. C. H. Leonard, to visit her flower garden, at Rochester.

At the first regular meeting of the Committee, it was voted to lay the application of Mr. Youell on the table, and to instruct the Chairman to privately visit the garden of the City Hospital, and if, in his judgment, he believed it to be worthy of an official inspection to notify the Committee. The Chairman did make the visit, but did not deem it advisable to call the Committee together for an official inspection, as there was nothing of special interest either in the plants or their arrangement, to call forth much praise. The heating apparatus for the greenhouse, described in the Garden Committee's Report for 1875, is worthy of a much better result than Mr. Youell seems to derive from it, judging from the display of plants on the hospital grounds, and that report, in the judgment of the Chairman would be a fair one for this year.

The application of Mr. Falconer to visit Mrs. C. H. Leonard's

flower garden, at Rochester, we are sorry to say, did not reach the Committee until after the date (August 1st), fixed by the Society, for receipt of applications, had passed; and the Committee voted reluctantly to abide by the rules, regretting that thereby they were depriving themselves of a pleasant day's duty, brought vividly to mind by the recollection of a visit to the hospitable mansion of Mrs. Leonard, in 1875. And in this connection the Committee would remind members and others that all applications must be in hand before August 1st, according to the rules.

Francis B. Hayes' Estate.

On the 8th of August, the Garden Committee, with a few invited guests, members of this Society and eminent for their good taste in horticultural affairs, visited the estate of Francis B. Hayes, at Lexington. This estate is entered for the Hunnewell Triennial Prize.

It consists of a farm of several hundred acres, nearly in the centre of which is situated a high eminence called Granny's Hill. Excavations on the top of this hill discovered a natural reservoir of water, which is conveyed in pipes to every portion of the farm.

Fifteen years ago the whole estate was a waste huckleberry pasture, uncultivated and unkept; but through the energy and indomitable perseverance of the proprietor, it now presents a wonderfully fertile and thrifty appearance.

The grounds about the mansion house were tastefully laid out and judiciously planted with choice trees and shrubs, and showed the effect of generous culture and good taste. The situations of the flower plats were judiciously chosen, and the beds were well filled with choice plants and flowers. Fruit and vegetable gardens were also located in the best manner, conveniently near the mansion, yet separated from it by the skilful arrangement of evergreens. The cultivation was thorough and clean; the vegetables and fruit generally were in good condition, and the management of the whole place was admirable, combining present comfort with future usefulness.

The recollections of the Revolution clustering around this place, make it worthy of all that the present owner is doing to improve and beautify it. Among the many interesting localities pointed out to the Committee, the most memorable is the knoll on which Samuel Adams and John Hancock halted as they retired from Lex-

ington on the morning of the 19th of April, 1775, when Adams, seeing that his country's independence was rapidly hastening on, exclaimed with the voice of a prophet, "Oh! what a glorious morning is this!" The Committee, as they stood upon this spot, and as they listened to the narration by their host of other interesting incidents, could not but desire that he should record the history of all that happened upon his estate, during that memorable time, and hand down to his posterity the remembrance that the soil they cultivate is sacred ground.

Future visits to this fine estate will be looked forward to with pleasure and a careful record will be kept by the incoming Committee.

Newton Cemetery.

On the 7th of September, your Committee paid an official visit to the Newton Cemetery, of which Henry Ross is superintendent.

They commend this cemetery to the inspection of all who like to see what can be done by judicious management toward beautifying nature. The natural advantages of this cemetery are probably not excelled by those of any other in this vicinity, but when these advantages are improved by the careful grouping of trees and shrubs, interspersed with plats of beautiful plants and flowers, it is difficult to express the satisfaction and pleasure experienced when viewing the results of such simple yet elegant taste, as is displayed in this cemetery. The Chairman of this Committee has visited this cemetery eight times during the past season, watching the progress of improvements as they were being developed; has looked over the plans for the future, and now takes great pleasure in commending this cemetery as a quiet and beautiful resting place for the body after the spirit has gone back to God who gave it. One of the plans in its management is to discountenance cumbrous granite curbings, thereby causing the grounds to present the aspect of a well kept landscape garden, without that heavy appearance where great quantities of granite are used. Another, and perhaps the best, regulation is that whenever a lot is sold an additional sum of money is required, the interest of which is used in the perpetual care of the lot, which precaution insures the grounds being always kept in the best possible condition. It is a pleasant thought while one is yet alive that his last bed will be continually and forever strewn with beautiful flowers, the smiles of an ever present God.

During the past summer the greenhouses connected with the cemetery have been very much enlarged, thereby enabling the superintendent to grow a greater quantity of plants to beautify the new lots added, the number of which increases year by year.

We award the superintendent, Mr. Henry Ross, a gratuity of $25 for correct taste displayed in planting flower-beds and beautifying the grounds.

For the Committee,

JOSEPH H. WOODFORD, *Chairman.*

REPORT

OF THE

COMMITTEE ON PUBLICATION AND DISCUSSION.

In accordance with the purpose expressed in our last report, your Committee obtained as lecturers during the past season, Professor George L. Goodale, of Harvard University; Professor Levi Stockbridge, of the Massachusetts Agricultural College; B. Pickman Mann, of Cambridge; and Byron D. Halsted, of the Bussey Institution. Their lectures were received with general interest, and led to discussions which were continued from week to week. We think it is evident that these researches of scientific investigators will be both interesting and serviceable to our members, and also, that there will be mutual advantage from this close comparison of theory and experience. Accordingly, your Committee purpose in the coming season to intersperse lectures, prize essays, and discussions, as has been done during the year past.

From the manuscripts submitted to the examination of the Committee, the following have been selected for prizes or gratuities:

For the best Essay upon the Ripening and Marketing of Pears, to J. W. Pierce, the prize of . . .	$25 00
For the best Essay upon Bottom Heat, its Benefits and Methods, to W. D. Philbrick, the prize of . .	25 00
For an Essay upon the Culture and Varieties of Roses, to William H. White, a gratuity of	10 00
For an Essay upon Garden Irrigation, its Advantages and Limits, to W. D. Philbrick, a gratuity of . .	10 00

For the Committee,

WILLIAM C. STRONG, *Chairman.*

REPORT OF THE SECRETARY.

I have the satisfaction to announce the completion, as far as the close of the year 1874, which was the period aimed at, of the history of the Society. The chapters have, as completed from time to time, been submitted to the examination of the President of the Society. Besides this work, and keeping the records of the Society and of the Executive Committee—the work coming under the head of editorial, including making notes of our discussions, writing out and submitting them to the various speakers for revision, the preparation of other matter contained in our Transactions and Schedules for the press, and superintending its printing, together with the reports of the weekly and annual exhibitions, all of which may be classed as among the routine duties of the Secretary—the correction of the lists of Honorary and Corresponding Members, which stood in great need of revision, has engaged my attention. These lists contained 345 names, of which 158 were unstarred, and of the latter there were 75 members, some of them among the first chosen at the organization of the Society in 1829, from whom nothing had been heard for many years, and of whom we did not even know whether or not they were still living. It was believed that a large part of this number must have deceased, and diligent correspondence has resulted in ascertaining that such was the case with more than half the number, whose names will appear in our next publication with the prefix of "the inevitable star," and in making many other corrections. I would here return thanks in behalf of the Society, to all who have so courteously and freely given their assistance in revising these lists, and would ask all correspondents of the Society, and any others into whose hands our publications may fall, to communicate such information as to the decease or change of residence of Honorary or Corresponding Members, or on other points, as will aid in the further correction of the lists.

Besides the subjects above mentioned, there have been the usual miscellaneous calls for information on different subjects, which, as might be expected, increase rather than diminish in number from year to year, all of which have been answered to the best of my ability.

ROBERT MANNING, *Secretary.*

REPORT

OF THE

COMMITTEE OF ARRANGEMENTS,

FOR THE YEAR 1877.

The Committee of Arrangements of the Massachusetts Horticultural Society would respectfully submit the following report:

Meetings of the Committee have been held at stated times during the year to consider their duties in connection with the Rose and Strawberry Shows in June, and the Annual Exhibition of the Society in September. At one of the meetings called in the early part of the season, Sub-Committees consisting of members of the Flower, Fruit, and Vegetable Committees were appointed for the purpose of having the tables properly arranged for the reception of Plants, Flowers, Fruits, and Vegetables from the growers; a duty which has been performed to the satisfaction of all parties, if we may judge from the expressions of approval from exhibitors and others.

To make a report of the entries of Fruits, Flowers, and Vegetables contributed to the several exhibitions would seem to be one of the duties of this Committee, but as this work has been fully and faithfully accomplished by the Chairmen of the several Committees, it would only be a useless repetition for the Committee of Arrangements to undertake to perform what has already been so well done. A full report of the action of the Committee would fail to be of very much interest, consisting as it does of much detail work, such as the arranging of the halls, seeing that proper places are assigned to the exhibitors, looking after the advertising and the printing of tickets, and seeing that the exhibitions are fully noticed and reported by the newspapers, which the Committee have done during the year 1877, as at all times in the past, to the best of their ability. No pains have been spared by the Committee to make the exhibitions a success, and a credit to the Society and to sustain its high standing in the community.

CHAS. H. B. BRECK, *Chairman.*

REPORT

OF THE

LIBRARY COMMITTEE.

The library has this year been largely increased by the purchase of many valuable books. The shelves are very much crowded, and it is hoped that during the next year additional accommodations will be provided.

The appropriation of the Society has been wholly expended for periodicals and binding, and the income of the Stickney Fund has been used, according to the terms of the loan, in the purchase of books exclusively.

Your Committee regret that it has been found necessary to cut down the appropriation by the Society for the coming year, but hope that during the year it will be increased to the usual amount.

A list of the books and magazines purchased and presented accompanies this report.

For the Committee,

WALDO O. ROSS, *Chairman.*

LIBRARY ACCESSIONS IN 1877.

Books Purchased.

Pritzel, G. A. Thesaurus Literaturæ Botanicæ Omnium Gentium. New edition, 4to. Leipsic: 1872.

Buek, H. W. Genera, Species, et Synonyma Candolleana, or Index to De Candolle's Prodromus. 4 vols. in 3. 8vo. Berlin: 1842–1874.

Hobbs, Charles E. Botanical Hand-Book, etc. Large 8vo. Boston: 1876.

Henslow, Rev. J. S. A Dictionary of Botanical Terms. New edition. 12mo., 190 wood cuts. London: no date.

Walpers, G. G. Annales Botanices Systematicæ. 7 vols. 8vo. Leipsic: 1848–1868.

Kunth, C. S. Enumeratio Plantarum, etc. 5 vols., 8vo., and 1 vol. of Supplement with 40 plates. Stutgard and Tubingen: 1833–1850.

Sertum Botanicum. Collection de Plantes remarquables par leur Utilité, leur Élégance, leur Éclat, on leur Nouveauté. Par une Société de Botanistes. 7 vols. Folio, 600 colored plates. Brussels: 1828.

Edwards, John. The British Herbal, etc. Folio, 100 colored plates. London: 1770.

Hooker, Sir William J. Filices Exoticæ; or Colored Figures and Descriptions of Exotic Ferns. 4to., 100 colored plates. London: 1859.

——— — —. British Jungermanniæ. Folio. 82 colored plates. London: 1816.

De Candolle, A. P. Astragalogia nempe Astragali, Biserrulae et Oxytropidis nec non Phacae, Colutae et Lessertiae Historia. Royal 4to. 50 plates. Paris: 1802.

Jacquin, Nicolaus Josephus. Oxalis Monographia. 4to. 81 pl., mostly colored. Vienna: 1794.

Miquél, F. A. Guil. Monographia Generis Melocacti. 4to. 11 plates, partly colored. Breslau and Bonn: 1840.

Baillon, M. H. Etude Générales du Groupe des Euphorbiacées. With atlas of 27 plates. Large 8vo. Paris: 1858.

Bateman, James. Monograph of Odontoglossum. Part VI., to complete duplicate set.

Allnutt, H. The Cactus and other Tropical Succulents. 16mo. 57 wood-cuts. London: 1877.

Darwin, Charles. The Effects of Cross and Self-Fertilization in the Vegetable Kingdom. 8vo. London: 1876.

——— ——. The Various Contrivances by which Orchids are Fertilized by Insects. 2d edition, 8vo., 38 wood-cuts. London: 1877.

——— ——. The Different Forms of Flowers in Plants of the same Species, with illustrations. 8vo. London: 1877.

Gray, Asa. Darwiniana; Essays and Reviews pertaining to Darwinism. 12mo. New York: 1877.

Barton, William P. C., M. D. Vegetable Materia Medica of the United States. 2 vols. 4to., 50 colored plates. Philadelphia: 1817, 1818.

Barton, Benjamin H., F. L. S., and Thomas Castle, M. D., F. L. S. The British Flora Medica. New edition, by John R. Jackson, A. L. S. 8vo. 48 colored plates. London: 1877.

Bentley, Robert, and Henry Trimen. Medicinal Plants. Parts 16–18, in continuation. 8vo., colored plates. London: 1877.

Reichenbach, H. G. L. Iconographia Botanica seu Plantæ Criticæ. etc. 10 vols., 4to., 1000 colored plates. Leipsic: 1823–1832.

Botanische Zeitung. 35 vols., small 4to. With plates. Berlin; 1843–72, 1873–76. Still publishing.

Seemann, Wilhelm E. G., and Berthold. Bonplandia. Zeitschrift für die gesammte Botanik. 10 vols. Imperial 8vo. Hannover: 1853–62.

Revue des Eaux et Forêts, etc. 15 vols. 8vo. Paris and Brussels, 1862–1876. Still publishing.

Répertoire de Législation et de Jurisprudence Forestières. 6 vols. 8vo. Paris: 1863–1875. Still publishing.

Brown, John Croumbie, LL. D. Reboisement in France; or Records of the Replanting of the Alps, the Cevennes, and the Pyrenees with Trees, Herbage, and Bush. 8vo. London: 1876.

Cooper, Ellwood. Forest Culture and Eucalyptus Trees. 12mo. San Francisco: 1876.

Bentham, Georgius. Plantæ Hartwegianæ. 8vo. London: 1839–1857.

Harvey, W. H., M. D., F. R. S., etc. Thesaurus Capensis; or Illustrations of the Plants of South Africa. 2 vols. 8vo. 200 plates. Dublin, London, and Cape Town: 1859, 1863.

——— — —. The Genera of South African Plants. 2d edition. Edited by J. D. Hooker, M. D., etc. Cape Town and London: 1868.

Munby, G. Flore de l' Algérie. 8vo. pamphlet. 7 plates. Paris: 1847.

Harcus, William. South Australia; its History, Resources and Productions. 8vo. Many wood-cuts. London: 1876.

Williams, B. S., F. R. H. S. The Orchid Growers' Manual. 5th edition. 12mo., with numerous illustrations. London: 1877.

Heath, Francis George. The Fern World. 8vo. Colored and other plates. London: 1877.

Roe, Rev. E. P. Play and Profit in my Garden. 8vo. New York: no date.

Burbidge, F. W. Cultivated Plants, their Propagation and Improvement. 8vo. Edinburgh and London: 1877.

Bossin, M. Les Plantes Bulbeuses. 2 vols. in one. 12mo. Paris: 1872.

Brill, Francis. Farm-Gardening and Seed-Growing. 12mo. New York: no date [1872?].

Buel, Jesse. The Farmer's Companion, etc. 12mo. Boston: 1840.

Child, David Lee. The Culture of the Beet and Manufacture of Beet Sugar. 12mo. Boston: 1840.

Eley, Henry, M. A. Geology in the Garden. 32mo. London: 1859.

Sprengel, Christian Konrad. Das Entdeckte Geheimniss der Natur im Bau und in der Befruchtung der Blumen. Small 4to. 25 copper plates. Berlin: 1793.

Packard, A. S. Jr. Half Hours with Insects. Parts 5—12, to complete the work. 8vo. Boston: 1877.

Books and Pamphlets Presented.

Burmannus, Joannis. Rariorum Africanarum Plantarum. 4to., 100 plates. Amsterdam: 1738. E. S. Rand, Jr.

Wight, Robert. Contributions to the Botany of India. 8vo. London: 1834. E. S. Rand, Jr.

——— —— and G. A. Walker-Arnott. Prodromus Floræ Peninsulæ Indiæ Orientalis. Vol. 1. 8vo. London: 1834. E. S. Rand, Jr.

Porter, T. C., and J. M. Coulter. Synopsis of the Flora of Colorado. 8vo. Washington: 1874. Henry Gannett.

Mueller, F. Vegetation of Chatham Islands. Royal 8vo. 7 plates. Melbourne: 1864. E. S. Rand, Jr.

Grisebach, A. Plantæ Wrightianæ e Cuba Orientalis. Parts I and II. From the Memoirs of the American Academy of Arts and Sciences, New Series, vol. 8. 2 pamphets, 4to. Cambridge: 1860, 1862. Prof. Asa Gray.

Mann, B. Pickman. Catalogue of the Phænogamous Plants of the United States, East of the Mississippi, and of the Vascular Cryptogamous Plants of North America, North of Mexico. 2d edition. 8vo. pamphlet. Cambridge: 1872. The Author.

Reid, G. H. An Essay on New South Wales. 8vo. pamphlet; map and plates. Sidney: 1876. John Wiley & Sons.

Jussieu, Adrian de. Cours Élémentaire d' Histoire Naturelle Botanique. 12mo. Paris: 1840. E. S. Rand, Jr.

Miquel, F. A. G. Cycadearum Monographia. Folio. 8 plates. Trajecti ad Rhenum: 1842. Prof. Asa Gray.

Lindley, Prof. John. Folia Orchidacea, an enumeration of the known species of Orchids. Parts I–VIII. 8vo. London: 1852—59. Prof. Asa Gray.

McNab, James. On the Re-Tubbing of Palms and other large Exotics. Results obtained from the Cutting and Transplanting of a Plaited Horn-Beam Hedge. On the discoveries of Mr. John Jeffrey and Mr. Robert Brown in a Botanical Expedition to British Columbia, with remarks on the cultivation of certain species. On the Effects of Pruning certain Coniferous Trees and Shrubs. 4 pamphlets, 8vo. Edinburgh: 1856, 1870, 1872. Waldo O. Ross.

Morren, Édouard. La Digestion Végétale. 8vo. pamphlet. Brussels: 1876. E. S. Rand, Jr.

Meehan, Thomas. Mr. Darwin on the Fertilization of Flowers. 8vo. pamphlet. Philadelphia: 1877. The Author.

Boardman, S. L. Some Notes on the History, Varieties, and Statistics of Indian Corn. 8vo. pamphlet. Augusta: 1877. The Author.

Oliver, Daniel, F. R. S., F. L. S. Guide to the Royal Botanic Gardens and Pleasure Grounds at Kew. Small 8vo. pamphlet; 56 wood-cuts. London: 1872. W. O. Ross.

Morren, Édouard. Correspondance Botanique. Liste des Jardins, des Chairs, et des Musées Botaniques du Monde. 5th edition; 8vo. pamphlet. Liege: 1877. The Author.

The Naturalist's Directory, containing the names of Naturalists, Chemists, Physicians, and Meteorologists. 8vo. pamphlet. Salem: 1877. Naturalist's Agency.

Annual Register of Rural Affairs, for 1878. L. Tucker & Son.

Sturtevant, E. Lewis and Joseph N. The North American Ayrshire Register. 8vo., 2 vols. in 1. South Framingham: 1875, 1877. E. L. Sturtevant.

Pleasonton, Gen. A. J. The Influence of the Blue Ray of the Sunlight, and of the Blue Color of the Sky in developing Animal and Vegetable Life, etc. 8vo. Philadelphia: 1876. Exchange.

Gregory, J. J. H. Onion Raising; what kinds to raise, and the way to raise them. Cabbages; how to grow them. Carrots, Mangolds, and Sugar Beets; how to raise, keep, and feed them. Squashes; how to grow them. 4 pamphlets. The Author.

New England Farmer. 4to., 13 numbers to fill gaps in the set. Essex Institute.

Bulletin de la Federation des Sociétés d'Horticulture de Belgique; 8vo. pamphlet. Liége: 1875. Édouard Morren, Secretary.

Bulletin de la Société Centrale d'Horticulture du Department de la Seine-Inferieure. Tome 18, Part 3. 8vo. pamphlet. Rouen: 1876.

Charter, Constitution, and By-Laws of the New York Horticultural Society. Schedule of Premiums offered by the same Society; 2 pamphlets. New York: 1877. James G. Murkland, Corresponding Secretary.

Proceedings of the Western New York Horticultural Society at their Twenty-seventh Annual Meeting, February, 1877. 8vo. pamphlet. P. Barry, President.

Proceedings of the New Jersey State Horticultural Society, January 1876. 8vo. pamphlet. B. B. Hance, Corresponding Secretary. The same for 1877. E. Williams, Secretary.

Proceedings of the Georgia State Horticultural Society at its first session, Macon, August, 1876. 8vo. pamphlet. Augusta: 1877. J. S. Newman, Secretary.

Tenth Annual Report of the Ohio State Horticultural Society for 1876–7. 8vo. pamphlet. M. B. Bateham, Secretary.

Transactions of the Indiana Horticultural Society, for 1871, 1872, 1874, 1875, 1876. 7 vols. 8vo. Indianapolis: 1871—1877. D. E. Hoffman.

Transactions of the Illinois Horticultural Society for the years 1875 and 1876. New series, vols. 9 and 10; 8vo. Chicago: 1876, 1877. O. L. Barler, Secretary.

Annual Report of the Iowa Horticultural Society for 1873, etc.; 8vo. Des Moines: 1874. W. C. Flagg. The same for 1876. G. B. Brackett, Secretary.

Transactions of the Wisconsin State Horticultural Society for 1871—74, and 1877. 5 vols. 8vo. F. W. Case.

Reports of the Kansas State Horticultural Society, 1871—1876. 6 vols., 8vo. Topeka: 1872—1877. G. C. Brackett, Secretary.

Transactions of the Worcester County Horticultural Society for 1876, with Schedule of Prizes for 1877. 8vo. pamphlet. Worcester: 1877. J. C. Newton, Librarian. Another copy from E. W. Lincoln, Secretary.

Transactions of the Marshfield Agricultural and Horticultural Society for 1876. 8vo. pamphlet. Plymouth: 1877. George M. Baker, President.

Wilder, Marshall P. Address delivered at the sixteenth session of the American Pomological Society, at Baltimore, September 12, 1877. 8vo. pamphlet. Boston: 1877. The Author.

Fourth Annual Report of the Maine State Pomological Society for 1876. G. B. Sawyer, Secretary.

Report of the Pennsylvania Fruit Growers' Society for the year 1876. 8vo. pamphlet. Harrisburg: 1876. E. B. Engle, Secretary.

Reports of the Michigan State Pomological Society, 1872—5. 4 vols., 8vo. Lansing: 1873—1876. R. G. Baird. The same for 1876. 1 vol., 8vo. Lansing: 1877. C. W. Garfield, Secretary.

Transactions and Second Report of the Fruit Committee of the Montreal Agricultural and Horticultural Society for 1876. Henry S. Evans, Secretary.

Report of the Fruit Growers' Association of the Province of Ontario for 1876. 8vo. pamphlet. D. W. Beadle, Secretary.

Second Annual Report of the Board of Commissioners of the Department of Public Parks of New York, for the year ending May, 1872. Also, Third General Report, from May 1, 1872, to December 31, 1873. Large 8vo. pamphlet; many maps, charts, and plates. Hon. A. H. Green, Commissioner.

Report of the South Park Commissioners to the Board of County Commissioners of Cook County, Illinois, for 1876. 8vo. pamphlet. Chicago: 1877. Two copies. H. W. Harmon, Secretary.

Tenth and Seventeenth Annual Reports of the Public Park Commission of Baltimore for 1869 and 1876. Two pamphlets, 8vo. Baltimore: 1870, 1877. D. Rayhies, Secretary.

Reports of the United States Department of Agriculture for 1875 and 1876. 2 vols., 8vo. The Commissioner.

Report of the United States Commissioner of Patents for the year 1851. Part II., Agricultural. 8vo. Washington: 1852. Essex Institute.

Twenty-first Annual Report of the Secretary of the Maine Board of Agriculture for the year 1876. 8vo. Augusta: 1876. Two copies. S. L. Boardman, Secretary.

Third Report of the Vermont State Board of Agriculture for the years 1875 and 1876. 8vo. Rutland: 1876. H. M. Seely, Secretary.

Twenty-fourth Report of the Secretary of the Massachusetts Board of Agriculture for 1876. 8vo. Boston: 1877. C. L. Flint, Secretary.

Colman, Henry. First, Second, and Third Reports on the Agriculture of Massachusetts, by Henry Colman, Commissioner. 3 pamphlets, 8vo. Boston: 1838—40, to complete the work. Essex Institute.

Tenth Annual Report of the Secretary of the Connecticut Board of Agriculture, 1876–7. 8vo. Hartford: 1877. T. S. Gold, Secretary.

Twenty-fifth Annual Report of the Indiana State Board of Agriculture, Vol. XVII., 1875. 8vo. Indianapolis: 1876. Alexander Heron, Secretary.

Transactions of the Department of Agriculture of Illinois for the year 1875. Vol. V., New Series. 8vo. Springfield: 1876. S. D. Fisher, Secretary.

Transactions of the Michigan State Board of Agriculture, 1872—76. 4 vols., 8vo. Lansing, 1873—6. R. G. Baird, Secretary. Also, extra copies for distribution.

Monthly Reports of the Kansas State Board of Agriculture for February, March, August, September, and October. 8vo. pamphlets. Topeka: 1877. Alfred Gray, Secretary.

Annual Reports of the Commissioner of Agriculture and Arts for the Province of Ontario, for 1874 and 1875. Two thick 8vo. pamphlets. Toronto, 1875, 1876. Thomas P. James.

Transactions of the Michigan Agricultural Society for 1849—59. 11 vols. 8vo. Lansing, 1850—61. Prof. W. J. Beal.

Transactions of the Wisconsin State Agricultural Society, 1873–4, 1874–5, 1876–7. 3 vols. 8vo. Madison, 1874—7. F. W. Case, Secretary.

Transactions of the Middlesex Agricultural Society, for the year 1876. 8vo. pamphlet. Boston: 1877. B. W. Brown, Secretary.

Transactions of the Essex Agricultural Society for 1876. 8vo. pamphlet. Salem: 1876. C. P. Preston, Secretary.

Bulletin of the Bussey Institution, Vol. II., Part 2; Vol. III., Part 1. 2 pamphlets, 8vo. Boston: 1877. Librarian of the Bussey Institution.

Transactions of the Imperial Botanic Garden of St. Petersburg. Vol. I., Part 2, 1872; Vol. II., Parts 1 and 2, 1873; Vol. III., Parts 1 and 2, 1874. 5 pamphlets, 8vo. C. S. Sargent.

Seventh Annual Report of the Geological Survey of Indiana, made during the year 1875, by E. T. Cox, State Geologist. 8vo. Maps and plate. Indianapolis: 1876. D. E. Hoffman.

Riley, Charles V. Potato Pests; being an illustrated account of the Colorado Potato Beetle, etc. 12mo., 49 wood-cuts. New York. No date [1876?]. Dr. George Thurber.

Packard, A. S. Report on the Rocky Mountain Locust and other Insects. 8vo. pamphlet. Plates, wood-cuts, and maps. Washington: 1877. Department of the Interior.

Department of the Interior. Bulletin of the United States Entomological Commission, Nos. 1 and 2. 8vo. pamphlets. Washington: 1877. The Commission.

Phylloxera. 4 French pamphlets, 4to. Paris: 1874—7. Prof. Asa Gray.

Mann, B. Pickman. The White Coffee-Leaf Miner. Reprinted from the American Naturalist. The Author. Also, from the same, four articles reprinted from the Proceedings of the Boston Society of Natural History.

Catalogue of the Hampton Normal and Agricultural Institute, for the year 1875–6, with maps showing the situation of schools taught by graduates. S. C. Armstrong, Principal.

Report of the Curators of the University of Missouri, etc., for 1876. 8vo. pamphlet. Prof. G. C. Swallow.

Report of the United States Commissioner of Education, for the year 1875. 8vo. Washington: 1876. The Bureau of Education.

Twelfth Annual Catalogue of the Officers and Students of the Massachusetts Institute of Technology, 1876–7. 8vo. pamphlet. Boston: 1876. The Institute.

Annual Report of the Mercantile Library Association of San Francisco, for 1876. 8vo. pamphlet. San Francisco: 1877. A. E. Whitaker, Librarian.

Proceedings of the Boston Society of Natural History. Vol. XVIII, Parts 3 and 4. 2 pamphlets, 8vo. Boston: 1876, 1877. Memoirs of the Boston Society of Natural History, Vol. II. Part 4, Nos. 5 and 6. 2 pamphlets, 4to. Boston: 1877. The Society.

Proceedings of the American Antiquarian Society. Nos. 67, 68, 69. 3 pamphlets, 8vo. Worcester: 1876, 1877. The Society.

Wilder, Marshall P. Address at the Annual Meeting of the New England Historic, Genealogical Society, January 3, 1877. 8vo. pamphlet. Boston: 1877. The Author.

Periodicals Taken.

English. — Gardener's Chronicle.
" Magazine.
Journal of Horticulture and Cottage Gardener.
The Garden.
Curtis' Botanical Magazine.
Floral Magazine.
Florist and Pomologist.
Floral World.
Journal of the Linnean Society.
Journal of Botany.
Farmer's Magazine.
Country Gentleman's Magazine.
Journal of the Royal Agricultural Society.
Journal of Forestry.

French. — Revue Horticole.
Revue des Eaus et Forêts.

Belgian. — Illustration Horticole.
Flore des Serres.
Belgique Horticole.

German. — Botanische Zeitung.

AMERICAN.—Country Gentleman.
American Farmer.
Silliman's Journal.
American Naturalist.

PERIODICALS PRESENTED.

New England Farmer.
Massachusetts Ploughman.
American Cultivator.
Scientific Farmer.
American Agriculturist.
Gardener's Monthly.
American Rural Home.
Maine Farmer.
Prairie Farmer.
Maryland Farmer.
Semi-Tropical.
Western Agriculturist.
Center Union Agriculturist.
Bulletin of the Essex Institute.
Bulletin of the Torrey Botanical Club.
Botanical Gazette.
Patent Right Gazette.
New York Semi-Weekly Tribune.
Rhode Island Press.
Boston Evening Transcript.
Boston Daily Globe.
Daily Evening Traveller.
Boston Morning Journal.
The Nursery.
The Cottage Hearth.

TREASURER'S REPORT,

FOR THE YEAR 1877.

ITEMS OF INCOME.

Balance of Cash on hand,	$229 89
Received of William Gray, Jr., to pay prizes for 1876,	140 00
" from Rent of Stores,	9,140 39
" " " Halls,	11,276 31
" " Admissions and Assessments,	720 00
Gross Receipts of Annual Exhibition,	373 75
Interest on Bonds, C., B. & Q. R. R.,	105 00
Discount at Market Bank,	11,634 00
Received from Mount Auburn Cemetery,	1,157 42
	$34,776 76

ITEMS OF EXPENDITURE.

Salaries,	$4,600 00	
Library Accessions,	1,587 41	
Heating and Water, less paid by tenants,	333 04	
Stationery, Postage, and Printing,	1,358 53	
Alterations and Repairs on Building,	408 55	
Gas,	1,557 14	
Furniture, Fixtures, and Repairs,	229 37	
Taxes,	3,340 50	
Testimonial to E. S. Rand, Jr.,	100 00	
Expenses of Annual Exhibition,	367 26	
Entertainment of Committee of Arrangements,	300 00	
Lectures,	75 00	
Paid Cash borrowed on call,	11,000 00	
Interest,	3,716 51	
Labor and Incidental Expenses,	801 68	
Balance of Prizes for 1876,	575 84	
Deposited to pay Prizes of 1877,	4,000 00	
Balance carried to new account,	425 93	
		$34,776 76

Boston, January 18, 1878.

We have examined the foregoing account and found it correct, and the balance of cash on hand, four hundred and twenty-five dollars and ninety-three cents, as stated.

C. O. Whitmore, H. H. Hunnewell, } *Finance Committee.*

ASSETS AND LIABILITIES.

Assets.

Real Estate, Furniture, and Exhibition Ware, costing		$256,585 56
Library, last year,	$15,561 40	
Added this year,	1,587 41	
		17,148 81
Bonds of C., B. & Q. R. R. par value,		1,500 00
Total,		$275,234 37

Liabilities.

Mortgage debt at 5½ per cent., payable September, 1883,	$60,000 00	
Loan without interest, payable to Harvard College in 1899,	12,000 00	
Note to Market National Bank,	12,000 00	
		$84,000 00
Balance of assets over liabilities,		$191,234 37

By last year's report our members numbered . . .				1,008
Of these were Life Members,		587		
Added by election, . .	2			
Added by commutation, .	1			
	—	3		
		590		
Deceased, ...	8			
Resigned, ...	1	9		
			581	
Annual members,		421		
Added by payment, . .	6			
Added by remission of fee, .	1	7		
		428		
Commuted, . . .	1			
Deceased, ...	8			
Withdrawn, . . .	5			
Discontinued for non-payment of dues, ...	42			
	—	56		
			372	
				953

Income from the above:	
2 Life, ...	$60 00
6 Annual, . . .	60 00
300 Subscriptions, . . .	600 00
	$720 00

In review of the foregoing, you will note a decrease in income from the stores of over three thousand dollars, and a gratifying increase in that from the halls. Mount Auburn has yielded a small return over the deficit of last year. The receipts from admissions and assessments have been unusually small and call for inquiry as to the cause. Doubtless the general depression of business has much to do with it, but has not the *opening of our prizes to all* much more? It was hoped that this liberal course would bring to us a fair addition to our membership, but, mark the result—fewer additions than for many years past, and a larger number discontinued

for non-payment than ever before in my experience. I invite attention to this subject; I might enlarge upon the avidity with which these outsiders claim their awards and other privileges, but I forbear. Gas, repairs, incidentals, labor, etc., are, of course, proportioned to the use of the halls.

I would gladly make a more cheerful report, but am happy to say that while individuals all around us are failing in business, and corporations are crippled, we have added but one thousand dollars to our liabilities and have a corresponding increase in our assets.

Respectfully submitted,

E. W. BUSWELL, *Treasurer.*

January 19th, 1878.

Dr. *Massachusetts Horticultural Society, in account with the Proprietors of the Cemetery of Mt. Auburn.* **Cr.**

For Sales and Improvements within the Cemetery for the year ending Dec. 31, 1877.

Cost of filling up and improving land at Mt. Auburn, and expenditure on account of new Receiving Tomb, for the year ending Dec. 31, 1877; the Massachusetts Horticultural Society being charged with their proportion of the same.			By Sales in January,		
New Receiving Tomb,	$1,859 10		" " " February,	25 00	
Grading Stone Farm,	2,023 63		" " " March,	775 00	
" Fountain Avenue,	454 50		" " " April,	2,400 00	
" Vinca Path,	125 80		" " " May,	3,331 75	
" Halcyon Lake and Avenue,	346 56		" " " June,	2,542 00	
" Dell Path,	234 94		" " " July,	1,747 00	
" Oak and Willow Avenues,	331 12		" " " August,	2,071 50	
One-quarter of	$5,375 65	$1,343 91	" " " September,	2,749 00	
Balance due in settlement of account, for the year 1876,		2,590 31	" " " October,	2,901 00	
Interest on $2,590.31 one year,		155 42	" " " November,	1,172 00	
Balance due Massachusetts Horticultural Society,		1,157 42	" " " December,	2,028 00	
			" Net amount of receipts from Receiving Tomb,	249 00	
				$22,591 25	
			Less paid for Lot No. 4,449 repurchased,	203 00	
				$22,388 25	
			Deduct for Annual Expenses,	1,400 00	
			Mass. Horticultural Society, one-fourth part, of	$20,988 25	$5,247 06
		$5,247 06			$5,247 06

E. & O. E.

H. B. MACKINTOSH, *Treasurer.*

BOSTON, December 31, 1877.

MOUNT AUBURN CEMETERY CORPORATION,

Office, No. 16 Pemberton Square.

BOSTON, January 1, 1878.

To the Finance Committee of the Mass. Hort. Society:

GENTLEMEN,—Herewith please find account for the year 1877, showing a balance to the *credit* of the Massachusetts Horticultural Society of $1,157.42.

Very respectfully, your obedient servant,

H. B. MACKINTOSH, *Treasurer.*

MASSACHUSETTS HORTICULTURAL SOCIETY,

To the Proprietors of the Cemetery of Mount Auburn, *Dr.*

For one-fourth (¼) part of the following expenditures for grading lands and building New Receiving Tomb, during 1877:

New Receiving Tomb.		
J. W. Grigg's bill of tiles for floor,	$600 00	
" " " " panels for vestibule,	134 25	
M. C. Warren, " " sheet lead, 523 lbs.,	47 21	
A. J. Wilkinson, bill of six lbs. of copper wire,	2 70	
City of Cambridge, bill of 6¼ perch blue stone,	4 69	
J. H. Reed & Co., bill of iron,	51 68	
75 tons block stone,	187 50	
1450 ft. sods,	32 62	
Spikes and paint,	8 30	
10 bbls. cement,	12 00	
2684 ft. 3 in. hard pine plank,	101 99	
Planing the above,	13 42	
20 ft. planed pine plank,	90	
57½ ft. moulding,	1 15	
142½ days, masons,	391 19	
91 " common labor,	159 25	
4½ " painter,	9 00	
33¾ " man and horse,	101 25	
		$1,859 10
Stone Farm.		
435½ days, men,	762 13	
420½ " men and horses,	1,261 50	
		2,023 63
Fountain Avenue.		
156 days, men,	273 00	
60½ " men and horses,	181 50	
		454 50
Amount carried forward,		$4,337 23

Amount brought forward,		$4,337 23
Vinca Path.		
36¾ days, men,	64 30	
20½ " men and horses,	61 50	
		125 80
Halcyon Lake and Avenue.		
43¾ days, men,	76 56	
90 " men and horses,	270 00	
		346 56
Dell Path.		
80¼ days, men,	140 44	
31½ " men and horses,	94 50	
		234 94
Oak and Willow Avenues.		
154½ days, men,	270 37	
20¼ " men and horses,	60 75	
		331 12
Total amount 1877,		$5,375 65
One-fourth part is,		$1,343 91

MOUNT AUBURN, Dec. 31, 1877. J. W. LOVERING, *Supt.*

I certify the foregoing to be of a true copy of accounts of improvements for the year 1877, rendered by the Superintendent.

H. B. MACKINTOSH, *Treasurer.*

Massachusetts Horticultural Society.

OFFICERS AND STANDING COMMITTEES FOR 1878.

President.

WILLIAM GRAY, Jr., of Boston.

Vice-Presidents.

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H. WELD FULLER, of Boston.
CHARLES H. B. BRECK, of Brighton.
JOHN C. HOVEY, of Cambridge.

Treasurer.

EDWIN W. BUSWELL, of Boston.

Secretary.

ROBERT MANNING, of Salem.*

Recording Secretary.

ROBERT MANNING, of Salem.

Professor of Botany and Vegetable Physiology.

JOHN ROBINSON, of Salem.

Professor of Entomology.

SAMUEL H. SCUDDER, of Cambridge.

Standing Committees:

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The President, WILLIAM GRAY, Jr., Chairman.
The Ex-Presidents, MARSHALL P. WILDER, CHARLES M. HOVEY, JAMES F. C. HYDE, WILLIAM C. STRONG, FRANCIS PARKMAN; Chairman of Finance Committee, C. O. WHITMORE; FEARING BURR, A. T. PERKINS, HERVEY DAVIS, F. L. AMES.

*The Secretary may be addressed at Horticultural Hall, Boston.

Finance.

CHARLES O. WHITMORE, Chairman.
H. HOLLIS HUNNEWELL, BENJAMIN P. CHENEY.

Publication and Discussion.

WILLIAM C. STRONG, Chairman.
A. B. MUZZEY, E. LEWIS STURTEVANT.

Establishing Prizes.

CHAIRMAN OF COMMITTEE ON FRUITS, Chairman.
CHAIRMEN OF COMMITTEES ON FLOWERS, VEGETABLES, AND GARDENS.
C. M. ATKINSON, P. BROWN HOVEY, GEORGE HILL.

Library.

WALDO O. ROSS, Chairman.
CHARLES S. SARGENT, HENRY P. WALCOTT,
WILLIAM E. ENDICOTT, J. D. W. FRENCH.
THE PROFESSOR OF BOTANY AND HORTICULTURAL PHYSIOLOGY.
THE PROFESSOR OF ENTOMOLOGY.

Gardens.

JOSEPH H. WOODFORD, Chairman.
CHAIRMEN OF COMMITTEES ON FRUITS, FLOWERS, AND VEGETABLES.
JAMES CRUICKSHANKS, GEORGE S. HARWOOD, C. A. PUTNAM.

Fruit.

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JOHN G. BARKER, Chairman.

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Committee of Arrangements.

CHARLES H. B. BRECK, Chairman.
CHAIRMEN OF COMMITTEES ON FRUITS, FLOWERS, VEGETABLES, AND GARDENS.

GEORGE W. PIERCE,	JOHN C. HOVEY,	EDWIN A. HALL,
GEORGE HILL,	E. F. WASHBURN,	
HERVEY DAVIS,	C. M. ATKINSON,	M. H. MERRIAM.

HONORARY MEMBERS.

A * denotes the member deceased.

*Benjamin Arbott, LL. D., Exeter, N. H.
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*Hon. John Quincy Adams, LL. D., late President of the United States.
*Prof. Louis Agassiz, Cambridge.
*William T. Aiton, late Curator of the Royal Gardens, Kew.
Thomas Allen, Ex-President of the St. Louis Horticultural Society, St. Louis, Mo., and Pittsfield, Mass.
*Hon. Samuel Appleton, Boston.
*Hon. James Arnold, New Bedford.
*Edward Nathaniel Bancroft, M. D., late President of the Horticultural and Agricultural Society of Jamaica.
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*Robert Barclay, Bury Hill, Dorking, Surrey, England.
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*L'Abbé Berlèse, Paris.
*Nicholas Biddle, Philadelphia.
Dr. Jacob Bigelow, Boston.
*Mrs. Bigelow, Medford.
*Le Chevalier Soulange Bodin, late Secrétaire-Général de la Société d'Horticulture de Paris.
Hon. George S. Boutwell, Groton.
*Josiah Bradlee, Boston.
*Hon. George N. Briggs, Pittsfield.
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*Zaccheus Collins, late President of the Pennsylvania Horticultural Society, Philadelphia.
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*William Coxe, Burlington, N. J.
*John P. Cushing, Watertown.
*Charles W. Dabney, late U. S. Consul, Fayal.
*Hon. John Davis, LL. D., Boston.
*Sir Humphry Davy, London.
*Gen. H. A. S. Dearborn, Roxbury.
*James Dickson, late Vice-President of the London Horticultural Society.
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*Capt. Jesse D. Elliot, U. S. Navy.
*Hon. Stephen Elliot, LL. D., Charleston, S. C.
*Allyn Charles Evanson, St. John, N. B., Secretary of the King's County Agricultural Society.
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*Hon. Horace Everett, Vermont.
*F. Falderman, late Curator of the Imperial Botanic Garden, St. Petersburg.
*Hon. Millard Fillmore, late President of the United States.
*Dr. F. E. Fischer, late Professor of Botany at the Imperial Garden, St. Petersburg.
*Hon. Theodore Frelinghuysen, late President of the American Agricultural Society.
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*Mrs. Mary Griffith, Charlies Hope, N. J.
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Thomas Hopkirk, President of the Glasgow Horticultural Society.
*David Hosack, M. D., late President of the New York Horticultural Society.
*Lewis Hunt, Huntsburg, O.
*Joseph R. Ingersoll, late President of the Pennsylvania Horticultural Society, Philadelphia.
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*Mrs. Martha Johonnot, Salem.
*Jared Potter Kirtland, LL. D.. East Rockport, O.
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Le Comte de Lasteyrie, Vice-President of the Horticultural Society of Paris.
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*Baron Justus Liebig, Giessen, Germany.

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*Nicholas Longworth, Cincinnati.
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John A. Lowell, Boston.
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Col. Theodore Lyman, Brookline.
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Joseph Maxwell, Rio Janeiro.
D. Smith McCauley, Tripoli.
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*Lewis John Mentens, Brussels.
*Hon. Charles F. Mercer, Virginia.
*François André Michaux, Paris.
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*Samuel L. Mitchill, LL. D., New York.
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Baron Ottenfels, Austrian Minister to the Ottoman Porte.
John Palmer, Calcutta.
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*Henry Pratt, Philadelphia.
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Rev. George Putnam, D. D., Roxbury.
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*Archibald John, Earl of Roseberry, late President of the Caledonian Horticultural Society.
*Joseph Sabine, late Secretary of the London Horticultural Society.
*Don Ramon de la Sagra, Cuba.
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*Sir Walter Scott.
*William Shaw, New York.

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*John S. Skinner, Baltimore.
George W. Smith, Boston.
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Mons. Tougard, President of the Horticultural Society of Rouen, France.
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*Col. W. Towson, late President of the Agricultural Society, Washington, D. C.
John Turner, Assistant Secretary of the London Horticultural Society.
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*Federal Vanderburg, M. D., New York.
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*Gen. Stephen Van Rensselaer, Albany, N. Y.
Joseph R. Van Zandt, Albany, N. Y.
*Benjamin Vaughan, Hallowell, Me.
*Petty Vaughan, London.
*Rev. N. Villleneuve, Montreal.
*Pierre Phillippe André Vilmorin, Paris.
*James Wadsworth, Geneseo, N. Y.
*Nathaniel Wallich, M. D., late Curator of the Botanic Garden, Calcutta.
*Malthus A. Ward, late Professor in Franklin College, Athens, Ga.
*Hon. Daniel Webster, Marshfield.
*Hon. John Welles, Boston.
*Jeremiah Wilkinson, Cumberland, R. I.
Hon. Robert C. Winthrop, Boston.
*Frederick Wolcott, Litchfield, Conn.
*Lawrence Young, late President of the Kentucky Horticultural Society Louisville.
*Ashton Yates, Liverpool.

CORRESPONDING MEMBERS.

A * denotes the member deceased.

*John Adlum, Georgetown, D. C.
Mons. Alfroy, Lieusaint, France.
A. B. Allen, Tom's River, N. J.
James T. Allan, Ex-President of the Nebraska State Horticultural Society, Omaha, Neb.
Rev. Thomas D. Anderson, New York.
*Thomas Appleton, U. S. Consul, Leghorn.
Don Francisco Aguilar, of Maldonado, in the Banda Oriental.
*Thomas Aspinwall, Brookline.
P. M. Augur, State Pomologist, Middlefield, Conn.
*Isaac Cox Barnet, late U. S. Consul, Paris.
Patrick Barry, Chairman of the General Fruit Committee of the American Pomological Society, Rochester, N. Y.
Augustine Baumann, Bolwiller, France.
*Eugéne Achille Baumann, Bolwiller, France.
Joseph Bernard Baumann, Bolwiller, France.
Napoleon Baumann, Bolwiller, France.
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Prof. W. J. Beal, Lansing, Michigan.
*Noel J. Becar, Brooklyn, N. Y.
*Edward Beck, Worton College, Isleworth, near London.
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Louis Édouard Berckmans, Rome, Ga.
Prosper J. Berckmans, Augusta, Georgia.
*Alexandre Bivort, late Secrétaire Général de la Société Van Mons, Fleurus, Belgique.
Mons. Tripet Le Blanc, Paris.
*Charles D. Bragdon, Pulaski, Oswego Co., N. Y.
*William D. Brincklé, M. D., Philadelphia.
John W. Brown, Fort Gaines, Ga.
Dr. Nehemiah Brush, East Florida.
Arthur Bryant, Sr., Ex-President of the Illinois State Horticultural Society, Princeton, Ill.
Robert Buist, Philadelphia.
*E. W. Bull, Hartford, Conn.
Rev. Robert Burnet, President of the Ontario Fruit Growers' Association, Hamilton, Canada West.
Alexander Burton, Cadiz.

George W. Campbell, Delaware, Ohio.
*Francis G. Carnes, New York.
*Robert Carr, Philadelphia.
*James Colvill, Chelsea, England.
*Rev. Henry Colman, Boston.
Benjamin E. Cotting, M. D., Boston.
*S. L. Dana, M. D., Lowell.
J. Decaisne, Professeur de Culture au Muséum d' Histoire Naturelle, Jardin des Plantes, Paris.
*James Deering, Portland, Me.
*H. F. Dickehut.
*Sir C. Wentworth Dilke, Bart., London.
Hon. Allen W. Dodge, Hamilton, Mass.
Rev. H. Honywood Dombrain, A. B., 3 Adelphi Terrace, Strand, W. C., London.
Charles Downing, Newburg, N. Y.
Parker Earle, South Pass, Ill.
F. R. Elliott, Ex-Secretary of the American Pomological Society, Cleveland, Ohio.
*Hon. Henry L. Ellsworth, late Commissioner of Patents, Washington, D C.
George Ellwanger, Rochester, N. Y.
George B. Emerson, LL. D., Winthrop.
*Ebenezer Emmons, M. D., Williamstown.
*A. H. Ernst, Cincinnati.
*Nathaniel Fellows, Cuba.
*Henry J. Finn, Newport, R. I.
W. C. Flagg, Secretary of the American Pomological Society, Moro, Ill.
*Michael Floy, late Vice-President of the New York Horticultural Society, New York City.
*John Fox, Washington, D. C.
*Hon. Russell Freeman, Sandwich.
Andrew S. Fuller, Ridgewood, N. J.
Henry Weld Fuller, Roxbury.
R. W. Furnas, President of the Nebraska State Horticultural Society, Brownville, Neb.
Augustus Gande, President of the Horticultural Society, Department of Sarthe, France.
*Robert H. Gardiner, Gardiner, Me.
*Benjamin Gardner, late U. S. Consul at Palermo.
*Capt. James P. Gerry, U. S. Navy.
*Abraham P. Gibson, late U. S. Consul at St. Petersburg.
*R. Glendenning, Chiswick, near London.
Prof. George L. Goodale, Cambridge.
Prof. Asa Gray, Cambridge.
O. B. Hadwen, Ex-President of the Worcester County Horticultural Society, Worcester.

*Charles Henry Hall, New York.
*Abraham Halsey, New York.
Dr. Charles C. Hamilton, President of the Fruit Growers' Association and International Show Society of Nova Scotia, Cornwallis.
*Rev. Thaddeus Mason Harris, D. D., Dorchester.
*Thaddeus William Harris, M. D., Cambridge.
*John Hay, Architect of the Caledonian Horticultural Society.
*Bernard Henry, Philadelphia.
Shirley Hibberd, Editor of the Gardeners' Magazine, London.
*J. J. Hitchcock, Baltimore.
Robert Hogg, LL. D., Editor of the Journal of Horticulture, London.
*Thomas Hogg, New York.
Thomas Hogg, New York.
J. C. Holding, Ex-Treasurer and Secretary of the Cape of Good Hope Agricultural Society, Cape Town, Africa.
Rev. S. Reynolds Hole, Caunton Manor, Newark, Nottinghamshire, England.
Fisher Holmes.
Sir Joseph Hooker, K. C. S. I., Director of the Royal Botanic Garden, Kew, England.
Josiah Hoopes, West Chester, Pa.
Prof. E. N. Horsford, Cambridge.
*Sanford Howard, Chicago, Ill.
Dr. William M. Howsley, President of the Kansas State Horticultural Society, Leavenworth.
*Isaac Hunter, Baltimore.
*Isaac Hurd, Cincinnati, Ohio.
George Husmann, Sedalia, Pettis County, Mo.
Thomas P. James, Cambridge.
Edward Jarvis, M. D., Dorchester.
William J. Johnson, M. D., Fort Gaines, Ga.
Samuel Kneeland, M. D., Boston.
*Mons. Laffay, St. Cloud, near Paris, France.
David Landreth, Ex-Corresponding Secretary of the Pennsylvania Horticultural Society, Bristol, Pa.
C. C. Langdon, Mobile, Alabama.
*Dr. William LeBaron, late State Entomologist, Geneva, Ill.
G. F. B. Leighton, President of the Norfolk Horticultural and Pomological Society, Norfolk, Va.
*E. S. H. Leonard, M. D., Providence.
*André Leroy, Author of the Dictionnaire de Pomologie, Angers, France.
J. Linden, Ghent, Belgium.
Hon. George Lunt, Boston.
*F. W. Macondray, San Francisco, Cal.
*James J. Mapes, LL. D., Newark, N. J.
*A. Mas, late President of the Horticultural Society, Bourg-en-Bresse, France.

Dr. Maxwell T. Masters, Editor of the Gardener's Chronicle, London.
*James Maury, late U. S. Consul, Liverpool.
T. C. Maxwell, Geneva, N. Y.
James McNab, Curator of the Botanic Garden, Edinburgh, Scotland.
Thomas Meehan, Editor of the Gardener's Monthly, Germantown, Pa.
*Allen Melville, New York.
John Miller, M. D., Secretary of the Horticultural and Agricultural Society of Jamaica.
*Stephen Mills, Flushing, N. Y.
*Charles M'Intosh, Dalkeith Palace, near Edinburg.
J. E. Mitchell, Philadelphia.
*William S. M'Lean, New York.
Guiseppe Monarchini, M. D., Cauca, Isle of Candia.
Édouard Morren, Editor of the Belgique Horticole Liége, Belgium.
*Horatio Newhall, M. D., Galena, Ill.
*David W. Offley, U. S. Agent, Smyrna.
James Ombrosi, U. S. Consul, Florence.
*John J. Palmer, New York.
*Victor Paquet, Paris.
*John W. Parker, late U. S. Consul, Amsterdam.
*Andrew Parmentier, Brooklyn, N. Y.
William Paul, Waltham Cross, London, N.
*Sir Joseph Paxton, M. P., Chatsworth, England.
*John L. Payson, late U. S. Consul, Messina.
*Com. M. C. Perry, U. S. Navy.
*David Porter, late U. S. Chargé d' Affaires at the Ottoman Porte.
*Alfred S. Prince, Flushing, N. Y.
*William R. Prince, Flushing, N. Y.
P. T. Quinn, Newark, N. J.
Rev. Rushton Radclyffe.
*William Foster Redding, Baltimore, Md.
D. Redmond, Ocean Springs, Miss.
M. D. Reynolds, Schenectady, N. Y.
*John H. Richards, M. D., Illinois.
Charles V. Riley, Entomologist, St. Louis, Mo.
*Mons. J. Rinz, Jr., Frankfort-on-the-Main.
*Thomas Rivers, Sawbridgeworth, Herts, England.
William Robinson, Editor of The Garden, London.
*Dr. J. Smyth Rogers, New York.
*Capt. William S. Rogers, U. S. Navy.
Bernard Rosier, M. D., Athens, Greece.
*Thomas Rotch, Philadelphia.
*George R. Russell, Roxbury,
John B. Russell, Washington, D. C.
*Rev. John Lewis Russell, Salem.
William Saunders, Department of Agriculture, Washington, D. C.
*William Shaler, late U. S. Consul-General, Havana, Cuba.

*Caleb R. Smith, Burlington, N. J.
*Daniel D. Smith, Burlington, N. J.
*Gideon B. Smith, late Editor of the American Farmer, Baltimore.
John Jay Smith, Germantown, Pa.
*Horatio Sprague, late U. S. Consul, Gibraltar.
Robert W. Starr, Cornwallis, Nova Scotia, Secretary of the Fruit Growers' Association and International Show Society, Halifax.
Dr John Stayman, Leavenworth, Kansas.
*Thomas H. Stevens, U. S. Navy, Middletown, Conn.
William F. Strangeway, British Secretary of Legation at Naples.
Dr. J. Strentzel, Martinez, Cal.
*James P. Sturgis, Canton.
William Summer, Pomaria, S. C.
Francis Summerest.
*Prof. Tenore, late Director of the Botanic Garden at Naples.
*J. E. Teschemacher, Boston.
*Robert Thompson, London.
*George C. Thorburn, New York.
Prof. George Thurber, Editor of the American Agriculturist, New York.
John Tilson, Jr., Edwardsville, Illinois.
Cav. Doct. Vincent Tinio, Director of the Botanic Garden at Palermo.
*Luther Tucker, Editor of the Cultivator, Albany, N. Y.
Carey Tyso, Wallingford, England.
*Louis Van Houtte, Ghent, Belgium.
*Alexander Vattemare, Paris.
*Emilien de Wael, Antwerp, Belgium,
John A. Warder, M. D., President of the Ohio State Horticultural Society, Cleves, O.
Anthony Waterer, Knapp Hill, near Woking, Surrey, England.
*J. Ambrose Wight, Editor of the Prairie Farmer, Chicago, Ill.
Benjamin Samuel Williams, Holloway, London, N.
Prof. John Wilson, Agricultural College, Cirencester, England.
*William Wilson, New York.
*Col. J. F. Wingate, Bath, Me.
*Joshua Wingate, Portland.
*Joseph Augustus Winthrop, Charleston, South Carolina.

MEMBERS FOR LIFE.

Change of residence, or any inaccuracies, should be promptly reported to the Secretary.

Adams, George E.,	Medford.	Bates, Amos,	Hingham.
Albro, Charles,	Taunton.	Bates, Caleb,	Kingston.
Alger, R. F.,	Dedham.	Bayley, John P.,	Boston.
Ames, F. L.,	Easton.	Beal, Alexander,	Dorchester.
Ames, F. M.,	Canton.	Beckford, D. R., Jr.,	Dedham.
Ames, George,	Boston.	Bell, Joseph H.,	Quincy.
Ames, P. A.,	"	Bemis, Emery,	Grantville.
Amory, Charles,	"	Berry, James,	Boston.
Amory, Frederick,	Brookline.	Bickford, Weare D.,	Allston.
Amory, James S.,	Boston.	Birchard, Charles,	Arlington.
Andrews, Charles L.,	Swampscott.	Black, J. W.,	Boston.
Andrews, Frank W.,	Boston.	Blagg, Samuel.	Newbern, N. C.
Andrews, W. T.,	"	Blanchard, J. W.,	Boston.
Andros, Milton,	Brookline.	Blaney, Henry,	Brookline.
Appleton, Edward,	Reading.	Blinn, R. D.,	Lexington.
Appleton, Francis H.,	Peabody.	Bocher, F.,	Boston.
Appleton, Wm. S.,	Boston.	Bockus, C. E.,	Dorchester.
Atkins, Elisha,	Belmont.	Bond, George W.,	Boston.
Austin, William R.,	Dorchester.	Borland, J. N.,	"
Avery, Edward,	Boston.	Botume, John,	Stoneham.
Ayer, Adams,	"	Bouvé, Thomas T.,	Boston.
Ayling, Isaac,	"	Bowditch, A. C.,	Somerville.
		Bowditch, J. Ingersoll,	Boston.
Bacon, George,	Brookline.	Bowditch, Wm. E.,	"
Bailey, Edwin C.,	Concord, N. H.	Brackett, C. H.,	Brighton.
Baker, Wm. E.,	Boston.	Brackett, C. N.,	Newton.
Bancroft, J. C.,	Milton.	Bradish, L. J.,	Boston.
Banfield, F. L.,	Boston.	Bragg, S. A. B.,	Mattapan.
Barnard, Rev. C. F.,	"	Breed, Andrews,	Lancaster.
Barnard, James M.,	"	Breed, Henry A.,	Lynn.
Barnard, R. M.,	Everett.	Bresee, Albert,	Hortonville, Vt.
Barnes, Walter S.,	Somerville.	Brewer, John Reed,	Boston.
Barnes, Wm. H.,	Boston.	Brewer, Otis,	"
Barney, Levi C.,	"	Brigham, W. T.,	"
Barratt, James,	Cambridge.	Bright, Jona. B.,	Waltham.
Barrett, Aaron,	Malden.	Bright, William E.,	"
Barrows, Thomas,	Dedham.	Brimmer, Martin,	Boston.
Bartlett, E.,	Newburyport.	Brintnall, Benj.,	"

Brooks, Francis,	Medford.	Clapp, Lemuel,	Dorchester.
Brooks, J. W.,	Milton.	Clapp, William C.,	"
Brooks, Peter C.,	Boston.	Clark, Orus,	Boston.
Brown, Charles E.,	Yarmouth, N.S.	Clark, W. L.,	Neponset.
Brown, Edward J.,	Brookline.	Clark, William S.,	Amherst.
Brown, G. Barnard,	Boston.	Clarke, Miss Cora H.,	Jamaica Plain.
Brown, George B.,	"	Clay, Henry,	Dorchester.
Brown, Jacob,	Woburn.	Cleary, Lawrence,	West Roxbury.
Brownell, E. S.,	Essex Junc., Vt.	Clement, Asa,	Dracut.
Bruce, N. F.,	Stoneham.	Cleveland, Ira,	Dedham.
Buckminster, W. J.,	Malden.	Cobb, Albert A.,	Brookline.
Bullard, Wm. S.,	Boston.	Coburn, Isaac E.,	Everett.
Burnett, Joseph,	Southborough.	Codman, James M.,	Brookline.
Burnham, T. O. H. P.,	Boston.	Codman, Ogden,	Lincoln.
Burr, Fearing,	Hingham.	Coffin, G. Winthrop,	West Roxbury.
Burr, Matthew H.,	"	Coffin, William E.,	Boston.
Buswell, E. W.,	Boston.	Converse, E. S.,	Malden.
Buswell, Frank E.,	"	Coolidge, Joshua,	Watertown.
Butler, Aaron,	Wakefield.	Copeland, Franklin,	West Dedham.
Butterfield, Wm. P.,	Arlington.	Courtis, William,	Marblehead.
		Cox, George P.,	Malden.
Cadness, John,	Flushing, N. Y.	Coy, Samuel I.,	Boston.
Cains, William,	South Boston.	Craft, George,	Brookline.
Calder, A. P.,	Boston.	Crocker, Uriel,	Boston.
Capen, John,	"	Crosby, Josiah,	Arlington.
Carlton, Samuel A.,	Somerville.	Crowell, Philander,	Chelsea.
Carruth, Charles,	Boston.	Crowell, R. H.,	"
Carruth, Nathan,	Dorchester.	Cruickshanks, James,	"
Carter, Miss Sabra,	Wilmington.	Cummings, John,	Woburn.
Chamberlain, C. W.,	Arlington.	Curtis, Charles F.,	West Roxbury.
Chandler, J. G.,	S. Lancaster.	Curtis, George S.,	Jamaica Plain.
Chapin, N. G.,	Brookline.	Cushing, J. G.,	Boston.
Chapman, Edward,	Arlington.	Cushing, R. M.,	"
Chase, A. J.,	Lynn.		
Chase, Daniel E.,	Somerville.	Daggett, H. C.,	Boston.
Chase, Hezekiah S.,	Boston.	Damon, Samuel G.,	Arlington.
Chase, William M.,	Worcester.	Dana, Charles B.,	Brookline.
Cheney, B. P.,	Boston.	Darling, Charles K.,	Boston.
Child, F. J.,	Cambridge.	Davenport, Edward,	Dorchester.
Child, William C.,	Medford.	Davenport, Geo. E.,	Boston.
Childs, Francis,	Charlestown.	Davenport, Henry,	"
Childs, N. R.,	Dorchester.	Davis, Curtis,	Cambridge.
Claflin, Henry,	Brighton.	Davis, Hervey,	Cambridgeport.
Claflin, William,	Newton.	Dawson, Jackson,	West Roxbury.
Clapp, Edward B.,	Dorchester.	Deblois, S. G.,	Boston.
Clapp, E. W.,	Walpole.	Denny, C. H.,	"
Clapp, J. H.,	Dorchester.	Denny, R. S.,	Dorchester.

Denton, Eben,	Braintree.
DeWolf, John L.,	Boston.
Dewson, F. A.,	"
Dexter, F. Gordon,	"
Dickerman, Geo. H.,	Somerville.
Dickinson, Alex.,	Cambridgeport.
Dike, Charles C.,	Stoneham.
Dix, Joseph,	Boston.
Dorr, George,	Dorchester.
Dove, George W. W.,	Andover.
Downer, Samuel,	Dorchester.
Durant, H. F.,	Boston.
Durant, William,	"
Durfee, Mrs. F. B.,	Fall River.
Durfee, George B.,	"
Eaton, Horace,	Quincy.
Eldridge, E. H.,	Boston.
Ellicott, J. P.,	Jamaica Plain.
Endicott, Wm. E.,	Canton.
Everett, George,	Concord.
Everett, Otis,	Boston.
Everett, William,	"
Farlow, John S.,	Newton.
Faxon, John,	Quincy.
Fay, Mrs. R. L.,	Chelsea.
Fenno, J. B.,	Boston.
Feukes, Edwin,	Ipswich.
Fillebrown, John,	Arlington.
Fisher, James,	Boston.
Fisher, Warren,	"
Flagg, Augustus,	"
Fleming, Edwin,	West Newton.
Fleming, William,	" "
Fletcher, J. W.,	Chelsea.
Flint, Charles L.,	Boston.
Flint, D. B.,	Watertown.
Flynt, William N.,	Monson.
Foster, John H.,	Boston.
Foster, J. W.,	Dorchester.
Fowle, W. B.,	Auburndale.
Freeland, Chas. Wm.,	Boston.
Freeman, Abraham,	Dorchester.
French, Jonathan,	Boston.
French, J. D. W.,	"
Fuller, Henry Weld,	"
Galvin, John,	West Roxbury.
Gardner, Henry N.,	Belmont.
Gibbs, Wolcott,	Cambridge.
Gilkey, R. F.,	Watertown.
Gillard, William,	Boston.
Gilson, F. Howard,	Reading.
Glover, Albert,	Boston.
Glover, Joseph B.,	"
Goddard, A. Warren,	Brookline.
Goddard, Mrs. M. T.,	Newton.
Gorham, J. L.,	Jamaica Plain.
Gould, Francis,	Arlington.
Gould, Samuel,	Boston.
Gray, James,	Wellesley.
Gregory, J. J. H.,	Marblehead.
Greig, George,	Newton.
Grinnell, Joseph,	New Bedford.
Groom, Thomas,	Dorchester.
Grundel, H.,	"
Guild, J. Anson,	Brookline.
Hadwen, O. B.,	Worcester.
Hall, Edwin A.,	Cambridgeport.
Hall, George A.,	Chelsea.
Hall, George R.,	Boston.
Hall, John R.,	"
Hall, Lewis,	Cambridge.
Hall, Stephen A.,	Revere.
Hall, William F.,	Brookline.
Halliday, W. H.,	Boston.
Hammond, Gard. G.,	"
Hammond, Samuel,	"
Harding, C. L.,	Cambridge.
Harding, G. W.,	Dorchester.
Harding, L. B.,	Boston.
Harding, W. C.,	"
Hardy, F. D., Jr.,	Cambridgeport.
Harris, Charles,	Cambridge.
Hastings, Edm. T.,	Boston.
Hatch, Anthony,	Cliftondale.
Hathaway, Seth W.,	Marblehead.
Haughton, James,	Boston.
Hayden, A. W.,	Portsm'th, N. H.
Hayes, Daniel F.,	Exeter, N. H.
Hayes, Francis B.,	Boston.
Hazeltine, H.,	"
Head, Charles D.,	Brookline.

Hilbourn, A. J., Chelsea.
Hill, George, Arlington.
Hill, John, Stoneham.
Hitchings, E. H., Boston.
Hodgkins, John E., Chelsea.
Hollis, J. W., Brighton.
Holt, Mrs. S. A., Winchester.
Hooper, Robert C., Boston.
Hooper, Thomas, Bridgewater.
Horner, Mrs. C. N. S., Georgetown.
Hovey, C. H., Cambridge.
Hovey, C. M., "
Hovey, John C., Cambridgeport.
Hovey, P. B., "
Howe, George, Boston.
Howland, John, Jr., New Bedford.
Hubbard, Charles T., Boston.
Hubbard, G. G., Cambridge.
Hubbard, J. C., Boston.
Hubbard, W. J., "
Huckins, J. W., "
Humphrey, F. J., Dorchester.
Hunneman, Jos. H., Boston.
Hunnewell, H. H., Wellesley.
Hunt, Franklin, Boston
Hunt, Moses, "
Hyde, J. F. C., Newton.

Inches, Henderson, Boston.
Inches, Herman B., "

Jackson, Abraham, Boston.
Janvrin, W. S., Revere.
Jeffries, John, Jr., Boston.
Jenks, C. W., "
Johnson, Francis M., Newton Centre.
Joyce, Mrs. Samuel, Medford.

Kakas, Edward, Medford.
Kelley, E. G., Newburyport.
Kendall, D. S., Woodstock, Ont.
Kendall, Edward, Cambridgeport.
Kendall, J. R., Woburn.
Kendrick, Mrs. H. P., Allston.
Kennedy, G. G., Boston.
Kenney, John M., Wareham.
Kent, John, Charlestown.

Keyes, E. W., Denver, Col.
Keyes, George, Concord.
Kidder, H. P., Boston.
Kimball, A. P., "
King, Franklin, Dorchester.
King, William S., Boston.
Kingman, A. A., Brookline.
Kingman, C. D., Middleborough.
Kinsley, Lyman, Cambridgeport.
Kittredge, E. A., Boston.

Lamb, Thomas, Boston.
Lancaster, C. B., Newton.
Lawrence, Amos A., Brookline.
Lawrence, Edward, Charlestown.
Lawrence, James, Boston.
Lawrence, James, Groton.
Lawrence, John, Boston.
Lawson, Peter, Lowell.
Leavens, S. Davis, Boston.
Lee, Henry, "
Lemme, Frederick, Natick.
Leuchars, R. B., Boston.
Lewis, A. S., Framingham.
Lewis, William G., "
Lincoln, D. Waldo, Worcester.
Lincoln, George, Hingham.
Locke, W. H., Belmont.
Lodge, Giles H., Swampscott.
Loftus, John P., Boston.
Loomis, J. B., Chelsea.
Lord, George C., Newton.
Loring, Alfred, South Hingham.
Loring, C. W., Boston.
Lothrop, Eben W., Chelsea.
Lovett, G. L., Boston.
Low, Ariel, "
Lowder, John, Watertown.
Lowell, Augustus, Boston.
Luke, Elijah H., Cambridgeport.
Lumb, Wm., Boston.
Lunt, C. H., Jamaica Plain.
Lyman, Theodore, Brookline.
Lyon, Henry, Charlestown.

Mahoney, John, Boston.
Mann, James F., Cambridge.

Mann, Jonathan,	Cambridge.
Manning, J. W.,	Reading.
Manning, Mrs. L. B.,	"
Manning, Robert,	Salem.
Mansfield, H. S.,	Blackstone.
Marland, A.,	Andover.
Marsh, Francis,	Dedham.
Marshall, Frederick,	Everett.
Martin, D. A.,	Chelsea.
Martin, J. S.,	Boston.
Mason, R. M.,	"
Matthews, Nathan,	"
McCarthy, T.,	"
McClure, John,	Revere.
Merriam, M. H.,	Lexington.
Merrifield, W. T.,	Worcester.
Miller, E. D.,	Dorchester.
Mills, Charles H.,	Boston.
Milmore, M.,	"
Milton, W. H.,	"
Minott, Charles,	Somerville.
Minton, James,	Dorchester.
Mixter, Charles,	Boston.
Moore, John B.,	Concord.
Morrill, Joseph, Jr.,	Boston.
Morse, S. B.,	"
Morse, Samuel F.,	"
Motley, Thomas,	West Roxbury,
Mudge, E. R.,	Swampscott.
Mudge, George A.,	Brookline.
Mudge, George W.,	Lynn.
Munroe, Otis,	Boston.
Needham, Daniel,	Groton.
Newhall, Cheever,	Dorchester.
Newhall, George,	"
Newhall, Josiah,	Lynnfield.
Newman, J. R.,	Winchester.
Newton, W. W.,	Brookline.
Nichols, Mrs. F.,	Dorchester.
Nourse, Benjamin F.,	Cambridgeport.
Nourse, B. F.,	Boston.
Osgood, Jas. Ripley,	Boston.
Otis, T. C.,	"
Oxnard, George D.,	"
Packer, C. H.,	Boston.
Page, Thomas,	Milwaukee.
Paine, Robert T.,	Boston.
Palmer, J. P.,	"
Park, J. C.,	Somerville.
Parker, Augustus,	Boston.
Parker, William A.,	"
Parkman, Francis,	Jamaica Plain.
Partridge, Henry,	Dunkirk, N. Y.
Partridge, Horace,	Somerville.
Pearce, John,	West Roxbury.
Peck, O. H.,	Franklin.
Peck, W. G.,	Arlington.
Penniman, A. P.,	Waltham.
Perkins, Augustus T.,	Boston.
Perkins, Edward N.,	Brookline.
Perkins, William P.,	"
Perry, George W.,	Malden.
Philbrick, William D.,	Newton Centre.
Pierce, George W.,	Everett.
Pierce, Henry L.,	Dorchester.
Pierce, S. B.,	"
Poole, Benjamin C.,	Chelsea.
Poor, John R.,	Somerville.
Pope, Alexander,	Dorchester.
Potter, Joseph S.,	Arlington.
Prang, L.,	Boston.
Pratt, Robert M.,	"
Pratt, William,	Winchester.
Pray, Mark W.,	Malden.
Prescott, C. H.,	Cornwallis, N. S.
Prescott, Eben C.,	Boston.
Prescott, W. G.,	"
Prescott, William G.,	Quincy.
Preston, George H.,	Boston.
Preston, John,	Dorchester.
Pringle, C. G.,	Charlotte, Vt.
Proctor, Thomas P.,	West Roxbury.
Prouty, Gardner,	Littleton.
Putnam, Joshua H.,	Brookline.
Ramsay, A. H.,	Cambridge.
Rand, Miss E. L.,	Newton.
Rand, E. S.,	Boston.
Rand, Oliver J.,	Cambridgeport.
Rawson, W. W.,	Arlington.

Rayner, John J.,	Lexington.	Smith, James H.,	Needham.
Reed, George W.,	Boston.	Smith, Joshua B.,	Cambridgeport.
Richards, John J.,	"	Smith, Peter,	Andover.
Richards, William B.,	"	Smith, W. B.,	Boston.
Richardson, C. E.,	"	Snow, Eben,	Cambridge.
Richardson, Geo. C.,	Cambridge.	Southmayd, John K.,	Boston.
Robbins, I. Gilbert,	Boston.	Sparhawk, Edwd. C.,	Brighton.
Robbins, Nathan,	Arlington.	Sparhawk, Geo.,	Lexington.
Robeson, W. R.,	Boston.	Spaulding, Edward,	Jamaica Plain.
Robinson, John,	Salem.	Spaulding, M. D.,	Boston.
Robinson, J. H.,	Dorchester.	Speare, Alden,	Newton Centre.
Rogers, John H.,	Boston.	Springall, George,	Malden.
Ross, Henry,	Newton.	Springer, John,	Sterling.
Ross, M. D.,	Boston.	Stetson, James A.,	Quincy.
Ross, Waldo O.,	"	Stetson, Nahum,	Bridgewater.
Russell, George,	W. Somerville.	Stickney, Rufus B.,	Somerville.
Russell, N. P.,	Boston.	Stimpson, George,	New York.
Russell, Walter,	Arlington.	Stimpson, H. H.,	Cambridge.
		Stone, Amos,	Everett.
Sampson, G. R.,	New York.	Stone, G. F.,	Newton.
Sanborn, Amos C.,	Cambridgeport.	Stone, Phineas J.,	Charlestown.
Sandford, O. S.,	Cordaville.	Story, E. A.,	Brighton.
Sargent, Charles S.,	Brookline.	Strong, William C.,	"
Sargent, Ignatius,	"	Sturgis, John H.,	Boston.
Saville, R. L.,	Brookline.	Sturgis, Russell, Jr.,	"
Sawyer, E. H.,	Easthampton.	Sturtevant, E. Lewis,	S. Framingham.
Sawyer, Timothy T.,	Charlestown.	Sumner, Edward,	Dedham.
Scott, Charles,	Newton.	Surette, L. A.,	Concord.
Scudder, C. W.,	Brookline.	Swain, Charles D.,	Roxbury.
Seaver, Nathaniel,	East Boston.		
Seaver, Robert,	Jamaica Plain.	Taft, John B.,	Boston.
Shaw, C. C.,	Boston.	Tappan, Charles,	"
Shaw, S. P.,	Cambridge.	Taylor, Horace B.,	"
Sheafe, Charles C.,	Boston.	Thacher, Alfred C.,	Dorchester.
Sheafe, William,	Brookline.	Thayer, Henry,	N. Cambridge.
Sheldon, O. S.,	Milton.	Thayer, Nathaniel,	Boston.
Shimmin, Charles F.,	Boston.	Thompson, S. Benton,	Lexington.
Shorey, John L.,	Lynn.	Thorndike, John H.,	Boston.
Skinner, Francis,	Boston.	Thurlow, T. C.,	Newburyport.
Slack, Chas. W.,	"	Tilton, Stephen W.,	Boston.
Slack, Lewis,	Brookline.	Todd, John,	Hingham.
Smith, Benj. G.,	Cambridge.	Tolman, Benj.,	Concord.
Smith, Charles A.,	Boston.	Tolman, Miss H. S.,	Boston.
Smith, Charles H.,	Jamaica Plain.	Torrey, Everett,	Charlestown.
Smith, Chauncy,	Cambridge.	Turner, J. M.,	Dorchester.
Smith, E. N.,	Boston.	Turner, R. W.,	Newton.
Smith, George O.,	"	Turner, Royal W.,	Randolph.

Underwood, Guy C., Boston.
Upham, Henry, Brookline.
Vass, W. J., Boston.
Vinton, A. H., D. D., "
Vose, B. C., Hyde Park.
Wainwright, Peter, Boston.
Wainwright, Wm. L., Braintree.
Wakefield, E. H., Chelsea.
Walcott, Edward, Pawtucket.
Walcott, Henry P., Cambridge.
Walker, Edw. C. R., Boston.
Walker, Samuel A., "
Walker, T. W., Waltham.
Walley, Mrs. W. P., Boston.
Ward, John, Newton.
Wardwell, W. H., " Centre.
Ware, Benjamin P., Marblehead.
Warren, G. W., Boston.
Wason, E., Brookline.
Waters, Edwin F., Newton Centre.
Waters, George F., Newton.
Watts, Isaac, Belmont.
Webber, A. D., Boston.
Weld, Aaron D., West Roxbury.
Weld, Dr. M. W., Boston.
Weld, Richard H., "
Weld, W. G., Brookline.
Weston, L. W., Lincoln.
Weston, Seth, Revere.
Wetherell, Leander, Boston.
Wheelwright, A. C., Boston.
Whipple, John A., "
Whitcomb, Wm. B., Medford.
White, B. C., Boston.
White, Edward A., "
White, Francis A., Brookline.
Whitely, Edward, Cambridge.
Whiting, Nathaniel, Brookline.
Whitmore, C. O., Boston.
Whitney Luther F., Charlestown.
Whittle, George W., Somerville.
Whytal, Thomas G., West Roxbury.
Wilbur, G. B., Watertown.
Wilcutt, Levi L., West Roxbury.
Wilder, Henry A., Boston.
Wilder, Marshall P., Dorchester.
Williams, Aaron D., Boston.
Williams, Benj. B., "
Williams, Philander, Taunton.
Willis, George W., Chelsea.
Willis, J. C., Boston.
Wilson, Henry W., South Boston.
Winship, F. Lyman, Brighton.
Winship, Herman, "
Woerd, C. V., Waltham.
Woerd, C. V., Jr., "
Wood, L. H., Marlborough.
Wood, R. W., Jamaica Plain.
Wood, Wm. K., West Newton.
Woodward, Royal, Brookline.
Wright, George C., West Acton.
Wrisley, Frank, New York.

ANNUAL MEMBERS.

Abbott, S. L., M. D.,	Boston.
Adams, Chas. F.,	Quincy.
Adams, C. S.,	Framingham.
Allen, Andrew F.,	Arlington.
Allen, Calvin,	Boston.
Allen, E. L.,	"
Allen, Nathaniel T.,	West Newton.
Allen, W. H.,	Dedham.
Alley, Franklin,	Marblehead.
Ames, R. W.,	Boston.
Anderson, C. J.,	Longwood.
Atkinson, Chas. M.,	Brookline.
Atkinson, Edward,	"
Atkinson, John,	West Newton.
Atkinson, W. B.,	Newburyport.
Batchelder, Samuel,	Cambridge.
Bacon, Augustus,	Boston.
Bacon, William,	"
Baker, W. P.,	Quincy.
Bard, James,	Framingham.
Barker, John G.,	Lynn.
Barnard, Mrs. Joel,	Arlington H'ts.
Barnes, Parker,	Dorchester.
Bayley, Dudley H.,	Boston.
Beard, E. L.,	Cambridge.
Becker, Frank,	Belmont.
Bird, Charles,	Revere.
Bird, John L.,	Dorchester.
Black, John A.,	Boston.
Bliss, B. K.,	New York.
Bolles, Matthew,	West Roxbury.
Bolles, William P.,	Boston.
Bolton, John B.,	Somerville.
Boot, William,	Boston.
Bouvé, Ephraim W.,	"
Brackett, E. A.,	Winchester.
Bradford, Chas. F.,	Boston.
Bradlee, John D.,	Milton.
Bradlee, J. T.,	Boston.
Breck, C. H.,	Brighton.
Breck, C. H. B.,	"
Brewer, Thomas M.,	Boston.
Brooks, George,	Brookline.
Brown, A. S.,	Jamaica Plain.
Brown, Atherton T.,	Boston.
Brown, Jona., Jr.,	Somerville.
Brown, Joseph T.,	Boston.
Bryant, G. J. F.,	"
Bull, E. W.,	Concord.
Bullard, Calvin,	Boston.
Burley, Edward,	Beverly.
Burr, Charles C.,	Newton.
Butler, Edward,	Wellesley.
Capen, Aaron D.,	Mattapan.
Carter, Maria E.,	Woburn.
Cartwright, James,	Wellesley.
Chadbourne, M. W.,	Watertown.
Chaffin, John C.,	Newton.
Chase, Mrs. C. B.,	Medford.
Chase, Henry L.,	Lynn.
Cheney, A. P.,	Natick.
Clark, James W.,	Framingham.
Clark, Joseph,	Canton.
Clark, Joseph W.,	Dedham.
Cobb, Edward W.,	Boston.
Cobb, Jonathan H.,	Dedham.
Coe, Henry F.,	West Roxbury.
Colby, E. P.,	Wakefield.
Cole, H. Hammond,	Chelsea.
Comley, James,	Lexington.
Converse, Parker L.,	Woburn.
Cox, James F.,	Abington.
Crafts, W. A.,	Boston.
Cruickshank, J. T.,	Natick.
Curtis, D. T.,	Boston.
Curtis, Joseph H.,	"
Cutter, George B.,	Weston.

Dana, Luther,	Newton.
Darling, Moses, Jr.,	South Boston.
Davis, Frederick,	Newton.
Davis, James,	Boston.
Davis, Thomas M.,	Cambridgeport.
Day, George B.,	Boston.
Dean, A. J.,	"
Denison, J. N.,	"
Dike, George W.,	Stoneham.
Dillaway, Chas. K.,	Boston.
Doogue, William,	"
Downe, Sumner,	Malden.
Downes, Mrs. S. M.,	Andover.
Dupee, James A.,	Brookline.
Dwight, David F.,	Boston.
Dyer, Mrs. E. D.,	Eyota, Minn.
Eaton, Jacob,	Cambridgeport.
Eaton, Russell P.,	Dorchester.
Edgar, William,	Newtonville.
Eustis, James,	Wakefield.
Ewings, L. B.,	Boston.
Falconer, James,	Boston.
Falconer, John,	Rochester.
Falconer, William,	Cambridge.
Farrier, Amasa,	Stoneham.
Farrier, Mrs. C.,	"
Fay, Henry G.,	Brookline.
Felton, A. W.,	West Newton.
Fenno, Thomas L.,	Somerville.
Fenno, Warren,	Revere.
Fletcher, Edwin,	Acton.
Foley, Bernard,	Boston.
Foster, Joshua T.,	Medford.
Foster, Nath'l, Jr.,	Belmont.
Fowle, H. D.,	Boston.
French, Henry F.,	Concord.
French, W. E.,	Boston.
Frost, George,	West Newton.
Frost, Rufus S.,	Chelsea.
Frost, Stiles,	West Newton.
Fuller, W. G.,	Stoneham.
Furneaux, Charles,	Melrose.
Gane, Henry A.,	West Newton.
Gardiner, Claudius B.,	Newburyport.
Gardner, John,	Dedham.
Garfield, Charles,	Medford.
Gaut, S. N.,	Somerville.
Gerry, Charles F.,	Hyde Park.
Gilbert, John,	Boston.
Gilbert, Samuel,	"
Gilbert, W. A.,	Neponset.
Gill, Mrs. E. M.,	Medford.
Gleason, C. W.,	Boston.
Gleason, Herbert,	Malden.
Godbold, G. A.,	Chelsea.
Goddard, Thomas,	Boston.
Goodwin, Lester,	Brighton.
Gove, George G.,	Cambridge.
Grant, Charles E.,	Boston.
Graves, Frank H.,	West Newton.
Gray, Edward,	Boston.
Gray, Howard,	Dorchester.
Gray, John C.,	Boston.
Gray, Wm., Jr.,	Dorchester.
Gray, Wm., 3d,	"
Greenwood, E. H.,	Newton Centre.
Grew, Henry,	Dorchester.
Guerineau, Louis,	Malden.
Hadley, T. B.,	Stoneham.
Haines, Robert J.,	Boston.
Haley, Jesse,	Cambridgeport.
Hall, William T.,	Revere.
Hamlin, D. A.,	South Boston.
Harris, Miss Ellen M.,	Jamaica Plain.
Harris, F. L.,	West Needham.
Hartwell, Samuel,	Lincoln.
Harwood, Geo. S.,	Newton.
Haskell, Edward,	New Bedford.
Hatch, Samuel,	Boston.
Hayes, John L.,	Cambridge.
Hayward, Geo. P.,	Hingham.
Hayward, James T.,	Boston.
Hazelton, H. L.,	"
Heath, Geo. W.,	Melrose.
Heustis, Warren,	Belmont.
Hews, Albert H.,	No. Cambridge.
Higbee, C. H.,	Salem.
Hill, Benj. D.,	Peabody.
Hill, Henry Y.,	Belmont.
Hinckley, Mrs. D. F.,	Chelsea.

Hittinger, Miss M. E., Belmont.
Hodgdon, R. L., Arlington.
Howe, Rufus, Marlboro'.
Hubbard, J. W., Boston.
Humphrey, G. W., Dedham.
Humphrey, John, Dover.

Ireland, George W., Somerville.

Jameson, G. W., East Lexington.
Johnson, H. A., Jamaica Plain.
Jones, Moses, Brookline.
Jordan, Samuel, Yarmouth.

Kelsey, Fred W., Waverly, N. Y.
Kendall, Jonas, Framingham.
Kennard, M. P., Brookline.
Kenrick, Miss A. C., Newton.
Kingman, Abner, Boston.

Lamprell, Simon, Marblehead.
Lang, John H. B., Dorchester.
Langworthy, I. P., Chelsea.
Law, G. A., Roslindale.
Leavens, E. W., Malden.
Lee, Francis H., Salem.
Lincoln, F. W., Jr., Boston.
Livermore, Isaac, Cambridgeport.
Livermore, Miss Maria, Mt. Auburn.
Locke, B. D., Arlington.
Loring, Charles G., Boston.
Loring, John A., "
Lothrop, D. W., West Medford.
Lothrop, H. A., Sharon.
Lothrop, Thornton K., Boston.
Lowell, John, Newton,

Markoe, G. F. H., Boston.
May, F. W. G., "
McDermott, Andrew, "
McIntire, Joseph, Melrose.
McIntyre, James, Malden.
McLaren, Anthony, Forest Hills.
Mellen, George M., Brookline.
Merrick, John M., Walpole.
Merrill, J. Warren, Cambridgeport.
Merrill, S. A., Danvers.
Millar, John L., Boston.
Miller, David, "
Mills, William, Somerville.
Minton, P. J., Forest Hills.
M'Intosh, A. S., Boston.
Morandi, Francis, Malden.
Morris, Thomas D., Boston.
Morrison, Hugh, Gloucester.
Morse, E. R., Somerville.
Morse, W. A., Boston.
Morton, J. H., "
Murray, Daniel C., Brookline.
Muzzey, A. B., Cambridge.

Nichols, J. R., Haverhill.
Northey, William, Medford.
Norton, P., Boston.
Noyes, George N., Auburndale.
Nugent, James, Boston.

O'Brien, James, Jamaica Plain.
Odiorne, F. H., Malden.
Oldreive, Richard, Newton.
Olney, Richard, West Roxbury,
Owen, John, Cambridge.

Paine, Benjamin F., Boston.
Palmer, Stevens G., "
Park, W. D., "
Parker, Harvey D., "
Parker, James M., Charlestown.
Parker, John, Boston.
Parsons, William, "
Parsons, William B., Rockport,
Patterson, James, Cambridge.
Payson, Samuel R., Boston.
Perkins, S. C., Dorchester.
Pettingill, Thos. S., Brookline.
Philbrick, Edward S., Boston.
Phillips, Nathaniel, Dorchester.
Pillsbury, H. H., Medford.
Plimpton, W. P., West Newton.
Power, Charles J., S. Framingham.
Pratt, L. G., West Newton.
Pratt, Samuel, Chelsea.

Preston, Jonathan, Boston.
Prince, F. O., Winchester.
Putnam, C. A., Salem.
Putnam, Francis, "
Putnam, H. W., "

Rand, George C., Newton Centre.
Randall, Macey, Sharon.
Ranlett, Charles A., Billerica.
Ranlett, S. A., Melrose.
Ray, Edwin, Boston.
Richards, Francis, "
Richards, John S., Brookline.
Richardson, E. P., Lawrence.
Richardson, Horace, Framingham.
Roberts, Edward, Hyde Park.
Rogers, John F., Cambridge.
Russell, George, Boston.

Saunders, Miss M. T., Salem.
Saville, George, Quincy.
Sawtell, J. M., Fitchburg.
Schlegel, Adam, Boston.
Scott, A. E., Lexington.
Scott, George H., Allston.
Scudder, Samuel H., Cambridge.
Shattuck, F. R., Boston.
Shaughnessy, J. J., "
Shedd, Abraham B., Lexington.
Shedd, Arthur B., "
Shepherd, C. W., West Newton.
Shepherd, Edwin, Lowell.
Sherman, Japhet, Medford.
Simpson, Michael H., Saxonville.
Sleeper, J. S., Boston.
Smallwood, Thomas, Newton.
Snow, E. A., Melrose.
Southworth, Edward, Quincy.
Spooner, W. H., Jamaica Plain.
Sprague, Charles J., Boston.
Squire, J. P., Arlington.
Stanwood, E. Howard, Grantville.
Starbird, Louis D., Malden.
Stearns, Charles, Brookline.
Stone, Eliphalet, Dedham.
Stone, Milton J., Brookline.
Stone, Samuel G., Charlestown.
Story, Miss Sarah W., Brighton.
Sullivan, J. L. D., Somerville.
Swan, C. W., Boston.

Tailby, Joseph, Wellesley.
Tainter, A. E., Medford.
Talbot, Josiah W., Norwood.
Tapper, Thomas, Canton.
Taylor, Moses, Acton.
Thompson, G. M., Waltham.
Tobey, Miss M. B., Brookline.
Todd, Jacob, Boston.
Torrey, Augustus, Beverly.
Tower, Elisha, Lexington.
Trautman, Martin, Boston.
Tucker, E. G., "
Turner, N. W., Everett.

Underwood, Wm. J., Belmont.

Vandine, Henry, Cambridgeport.
Van Voorhies, H. W., Everett.
Vinton, Mrs. C. A., Boston.

Walker, Charles H., Chelsea.
Walker, Joseph T., Boston.
Walker, Wm. P., Somerville.
Wallis, William, Boston.
Walsh, M. H., Brighton.
Waltham, George, Nahant.
Ward, Edward A., Cambridge.
Warren, Samuel D., Waltham.
Washburn, E. F., Neponset.
Watson, B. M., Plymouth.
Watson, David, Malden.
Webster, John, Salem.
Wellington, Chas. A., E. Lexington.
Wellington, Jos. V., Cambridge.
Wells, Benjamin T., Boston.
Weston, Mrs. L. P., Danvers.
Wetherell, John G., Boston.
Wheatland, Henry, Salem.
Wheeler, Miss Ann C. Cambridgeport.
Wheildon, Wm. W., Concord.
White, N. B., Norwood.
White, T. C., Charlestown.
Whitney, Joel, Winchester.

Wilde, Hiram,	Randolph.	Wood, Mrs. Anna D.,	West Newton.
Williams, Dudley,	Jamaica Plain.	Wood, Miss C. S.,	" "
Williams, Stephen,	Boston.	Wood, E. W.,	" "
Wilmarth, H. D.,	Jamaica Plain.	Woodford, Jos. H.,	Newton.
Wilson, B. O.,	Watertown.		
Wilson, George W.,	Malden.	Young, Thos., Jr.,	Somerville.
Wiswall, Henry M.,	Watertown.		
Wolcott, Mrs. J. W.,	Boston.	Zirngiebel, D.,	Needham.

EXTRACTS FROM THE BY-LAWS.

SECTION XXVI.—Life Members.

The payment of thirty dollars shall constitute a Life Membership, and exempt the member from all future assessments; and any member, having once paid an admission fee, may become a Life Member by the payment of twenty dollars in addition thereto.

SECTION XXVII.—Admission Fee and Annual Assessment.

Every subscription member, before he receives his Diploma, or exercises the privileges of a member, shall pay the sum of ten dollars as an admission fee, and shall be subject afterwards to an annual assessment of two dollars.

SECTION XXIX.—Discontinuance of Membership.

Any member who shall neglect for the space of two years to pay his annual assessment shall cease to be a member of the Society; and the Treasurer shall erase his name from the List of Members.

The attention of Annual Members is particularly called to Section XXIX.

ERRATA.

Part I., 1877, page 67, line 24, for "is a moth," read "becomes a moth."
Page 68, line 29, for "Townsend," read "Townend."

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